

# CORNELL UNIVERSITY

## OFFICIAL PUBLICATION

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APRIL 7, 1951

### *College of Arts and Sciences*

ANNOUNCEMENT  
FOR 1951-52 SESSIONS



# *The University Calendar*

1951-52

## *FALL TERM*

Freshman Orientation begins....	Sept. 14, <i>Friday</i>
Registration.....	Sept. 17-18, <i>Monday and Tuesday</i>
Instruction begins.....	Sept. 19, <i>Wednesday</i> , 1 P.M.
Midterm grades due.....	Nov. 7, <i>Wednesday</i>
Thanksgiving recess:	
Instruction suspended.....	Nov. 21, <i>Wednesday</i> , 12:50 P.M.
Instruction resumed.....	Nov. 26, <i>Monday</i> , 8 A.M.
Christmas recess:	
Instruction suspended.....	Dec. 19, <i>Wednesday</i> , 10 P.M.
Instruction resumed.....	Jan. 3, 1952, <i>Thursday</i> , 8 A.M.
Examinations begin.....	Jan. 21, <i>Monday</i>
Examinations end.....	Jan. 30, <i>Wednesday</i>
Midyear holiday.....	Jan. 31, <i>Thursday</i>

## *SPRING TERM*

Registration.....	Feb. 1-2, <i>Friday and Saturday</i>
Instruction begins.....	Feb. 4, <i>Monday</i> , 8 A.M.
Midterm grades due.....	Mar. 22, <i>Saturday</i>
Spring recess:	
Instruction suspended.....	Mar. 22, <i>Saturday</i> , 12:50 P.M.
Instruction resumed.....	Mar. 31, <i>Monday</i> , 8 A.M.
Examinations begin.....	May 26, <i>Monday</i>
Examinations end.....	June 3, <i>Tuesday</i>
Commencement Day.....	June 9, <i>Monday</i>

## CORNELL UNIVERSITY OFFICIAL PUBLICATION

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# *Faculty*

THEODORE P. WRIGHT, Acting President of the University and Vice President for Research.

EDMUND EZRA DAY, President Emeritus.

LEONARD SLATER COTTRELL, Jr., Dean of the College of Arts and Sciences.

MELVIN LOVELL HULSE, Associate Dean and Secretary of the College of Arts and Sciences.

BLANCHARD LIVINGSTONE RIDEOUT, Assistant Dean of the College of Arts and Sciences.

ROLLIN LAWRENCE PERRY, Chairman of the Advisory Board for Underclassmen, College of Arts and Sciences.

JOANNE WOOLLEY, Assistant Secretary of the College of Arts and Sciences.

MEYER HOWARD ABRAMS, Ph.D., Associate Professor of English.

JOHN JOSEPH ADAIR, Ph.D., Assistant Professor of Anthropology.

GEORGE PLIMPTON ADAMS, Jr., Ph.D., Associate Professor of Economics.

ROBERT MARTIN ADAMS, Ph.D., Assistant Professor of English.

HOWARD BERNHARDT ADELMANN, Ph.D., Professor of Histology and Embryology.

FREDERICK BROWNING AGARD, Ph.D., Associate Professor of Linguistics.

RALPH PALMER AGNEW, Ph.D., D.Sc., Professor of Mathematics.

H. DARKES ALBRIGHT, Ph.D., Associate Professor of Speech and Drama.

ARTHUR AUGUSTUS ALLEN, Ph.D., Professor of Ornithology.

ALFRED LEONARD ANDERSON, Ph.D., Associate Professor of Geology.

ALBERT LEROY ANDREWS, Ph.D., Professor of Germanic Philology, Emeritus.

EUGENE PLUMB ANDREWS, A.B., Professor of Archaeology, Emeritus.

CLARENCE S. ANGELL, M.A., Instructor in Speech and Drama.

CARROLL CLYDE ARNOLD, Ph.D., Assistant Professor of Speech and Drama.

WILLIAM WEAVER AUSTIN, Ph.D., Associate Professor of Music.

CHRISTINE WILLIAMS AYOUB, Ph.D., Faculty Instructor in Mathematics.

CHARLES PARKER BAKER, Ph.D., Assistant Professor of Nuclear Studies.

ROBERT CECIL BALD, Ph.D., D.Litt., Professor of English.

WILDER DWIGHT BANCROFT, Ph.D., D.Sc., LL.D., Professor of Physical Chemistry, Emeritus.

LEROY LESHER BARNES, Ph.D., Professor of Physics.

MILTON LEON BARRON, Ph.D., Assistant Professor of Sociology.

EDWARD LEWIS BASSETT, Ph.D., Assistant Professor of the Classics.

SIMON H. BAUER, Ph.D., Professor of Chemistry.

FREDERICK BEDELL, Ph.D., Professor of Physics, Emeritus.

MADISON BENTLEY, Ph.D., Professor of Psychology, Emeritus.

HANS ALBRECHT BETHE, Ph.D., John Wendell Anderson Professor of Physics.

JOHN WALTER BICKNELL, Ph.D., Faculty Instructor in English.

KNIGHT BIGGERSTAFF, Ph.D., Professor of Chinese History.

\*MORRIS GILBERT BISHOP, Ph.D., Kappa Alpha Professor of the Romance Languages and Literatures.

MAX BLACK, Ph.D., Professor of Philosophy.

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\*Sabbatic Leave, 1951-52.

- ALFRED T. BLOMQUIST, Ph.D., Associate Professor of Chemistry.  
 ALBERT WILHELM BOESCHE, Ph.D., Professor of German, Emeritus.  
 SAMUEL LATIMER BOOTHROYD, M.S., Professor of Astronomy, Emeritus.  
 JULIAN PLEASANT BRETZ, Ph.D., Goldwin Smith Professor of American History, Emeritus.  
 HERBERT WHITTAKER BRIGGS, Ph.D., Professor of International Law.  
 THOMAS ROLAND BRIGGS, Ph.D., Professor of Physical Chemistry.  
 URIE BRONFENBRENNER, Ph.D., Professor of Psychology.  
 LESLIE NATHAN BROUGHTON, Ph.D., Professor of English, Emeritus.  
 STUART MACDONALD BROWN, JR., Ph.D., Associate Professor of Philosophy.  
 JAMES DABNEY BURFOOT, JR., Ph.D., Associate Professor of Geology.  
 EDWIN ARTHUR BURTT, Ph.D., Susan Linn Sage Professor of Philosophy.  
 WILLIAM A. CAMPBELL, M.A., Associate Professor of Music.  
 HARRY CAPLAN, Ph.D., Goldwin Smith Professor of the Classical Languages and Literatures.  
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 ROBERT THEODORE CLAUSEN, Ph.D., Professor of Botany.  
 GIUSEPPE COCCONI, Ph.D., Associate Professor of Physics.  
 LAMONT C. COLE, Ph.D., Assistant Professor of Zoology.  
 W. STORRS COLE, Ph.D., Professor of Geology.  
 LANE COOPER, Ph.D., Litt.D., Professor of the English Language and Literature, Emeritus.  
 MORRIS ALBERT COPELAND, Ph.D., Professor of Economics.  
 DALE RAYMOND CORSON, Ph.D., Associate Professor of Physics.  
 LEONARD SLATER COTTRELL, JR., Ph.D., Visiting Professor of Sociology.  
 J MILTON COWAN, Ph.D., Professor of Linguistics.  
 GEORGE FERRIS CRONKHITE, Ph.D., Faculty Instructor in English.  
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 JOHN P. DEAN, Ph.D., Assistant Professor of Sociology.  
 PETER J. W. DEBYE, Ph.D., Todd Professor of Chemistry.  
 DAYTON NIGEL DENNETT, M.A., Instructor in English.  
 DELOS F. DETAR, Ph.D., Assistant Professor of Chemistry.  
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 FREEMAN JOHN DYSON, B.A., Professor of Physics.  
 ARTHUR JOHNSON EAMES, Ph.D., Professor of Botany, Emeritus.  
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 PAUL WALLACE GATES, Ph.D., Goldwin Smith Professor of American History.  
 ROSWELL CLIFTON GIBBS, Ph.D., Professor of Physics Emeritus.  
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 WILLIAM THOMAS HOLSER, Ph.D., Assistant Professor of Geology.  
 JOSEPH DOUGLAS HOOD, Ph.D., Professor of Biology.  
 HARVEY EARL HOWE, Ph.D., Professor of Physics, Emeritus.  
 ROBERT LESLIE HULL, Ph.D., Associate Professor of Music and Director of University Musical Activities.  
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 WALLIE ABRAHAM HURWITZ, Ph.D., Professor of Mathematics.  
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 †JAMES HUTTON, Ph.D., Professor of the Classics.  
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\*Sabbatic Leave, 1951-52.

†Sabbatic Leave, spring term 1951-52.

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 ALEXANDER H. LEIGHTON, M.D., Professor of Sociology and Anthropology.  
 SAMUEL LEESON LEONARD, Ph.D., Associate Professor of Zoology.  
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 HOWARD SCOTT LIDDELL, Ph.D., Professor of Psychobiology.  
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 FRANKLIN A. LONG, Ph.D., Professor of Chemistry.  
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‡Sabbatic Leave, 1951-52.

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 CHARLES MERRICK NEVIN, Ph.D., Professor of Geology.  
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 MELVIN LORREL NICHOLS, Ph.D., Professor of Analytical Chemistry.  
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 WILLIAM OECHLER, Ph.D., Assistant Professor of German Literature.  
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 ROBERT MORRIS OGDEN, Ph.D., Professor of Psychology, Emeritus.  
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 PAUL OLUM, Ph.D., Assistant Professor of Mathematics.  
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 JACOB PAPISH, Ph.D., Professor of Chemistry.  
 LYMAN GEORGE PARRATT, Ph.D., Professor of Physics.  
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 WILLIAM MERRITT SALE, Jr., Ph.D., Professor of English.  
 SEVERT JAY SAVEREID, M.A., Instructor in Speech and Drama.  
 HAROLD A. SCHERAGA, Ph.D., Assistant Professor of Chemistry.  
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 NATHAN SCHWARTZ, Ph.D., Faculty Instructor in Physics.

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\*Sabbatic Leave, 1951-52.



- JOHN ARMSON SESSIONS, M.A., Instructor in English.  
HAROLD E. SHADICK, M.A., Professor of Chinese Literature.  
ARNOLD S. SHAPIRO, Ph.D., Instructor in Mathematics.  
HARVEY IRWIN SHAPIRO, M.A., Instructor in English.  
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R. LAURISTON SHARP, Ph.D., Professor of Anthropology.  
ROBERT WILLIAM SHAW, Ph.D., Associate Professor of Astronomy.  
ROBERT PELTON SIBLEY, M.A., L.H.D., Professor of English, Emeritus.  
LOUIS SIEGELMAN, Ph.D., Faculty Instructor in Economics.  
MICHELL JOSEPH SIENKO, Ph.D., Assistant Professor of Chemistry.  
HAROLD ROBERT SMART, Ph.D., Associate Professor of Philosophy.  
FREDERICK MILLER SMITH, A.B., Professor of English, Emeritus.  
LLOYD PRESTON SMITH, Ph.D., Professor of Physics.  
PATRICIA CAIN SMITH, Ph.D., Assistant Professor of Psychology.  
FRIEDRICH SOLMSEN, Ph.D., Professor of the Classics.  
ROBERT LAMB SPROULL, Ph.D., Associate Professor of Physics.  
MARTHA ELIZABETH STAHR, Ph.D., Assistant Professor of Astronomy.  
WALTER HUTCHINSON STANTON, Ph.D., Associate Professor of Speech and Drama.  
CARL STEPHENSON, Ph.D., Professor of History.  
GORDON F. STREIB, M.A., Instructor in Sociology.  
FREDERICK HARRY STUTZ, Ph.D., Associate Professor of Education.  
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HARRY PORTER WELD, Ph.D., Professor of Psychology, Emeritus.  
JOHN WEST WELLS, Ph.D., Professor of Geology.  
JAMES F. WHITE, Ph.D., Visiting Assistant Professor of Linguistics.  
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HERBERT AUGUST WICHELNS, Ph.D., Professor of Speech and Drama.  
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WILLIAM MOONEY WOODWARD, Ph.D., Assistant Professor of Physics.  
ALBERT HAZEN WRIGHT, Ph.D., Professor of Zoology, Emeritus.  
BERTRAM YOOD, Ph.D., Assistant Professor of Mathematics.  
BENJAMIN PERCY YOUNG, Ph.D., Associate Professor of Zoology.  
CHARLES VAN PATTEN YOUNG, A.B., Professor of Physical Education, Emeritus.



## *College of Arts and Sciences*

THE College of Arts and Sciences offers instruction in classical and modern languages and literatures, philosophy, and music and the fine arts; in history, the social studies, and psychology; and in mathematics and the natural sciences. The Faculty requires: (1) that each student before graduation shall pursue a course, or courses, designed to make him competent in the use of the English language; (2) that he shall demonstrate or achieve proficiency in a foreign language; and (3) that he shall attain a basic knowledge of certain areas of the humanities, the social studies, and the natural sciences. Before the end of the second year the student must have selected a major field of study for the remainder of his work. This requirement is broadly conceived to include a sequential and a related group of courses, by means of which he may secure a degree of mastery of a specialized field of knowledge. The remainder of his course of study is largely elective under the supervision of a Faculty adviser whom he chooses and who will assist him in making a reasonable and appropriate selection of courses. Many of the subject offerings of the other colleges of the University are available to him, either as electives or as related subjects for the fulfillment of his major requirements.

The general purpose of the College of Arts and Sciences is liberal and nontechnical. The definition of a liberal college is found in the subjects which make up its curriculum; namely, those subjects which, in the history of human civilization, have distinguished themselves as the means whereby man has come to understand himself and the world in which he lives. As thus conceived, a liberal education is a special knowledge of some general field of human understanding, erected upon a fundamental training in the humanities, natural sciences, and the social studies.

The facilities of the College are adequate in staff and equipment to give personal attention to the varying needs of individual students, including requirements of a prevocational and preprofessional nature. Advanced courses and opportunities for research are available in the undergraduate years to those who are qualified to make use of them; and in addition to his regular courses, a student may work informally under the supervision of his major adviser (see p. 20). Thus he may complete his education in a manner more flexible than would other-

wise be possible. A student is expected to accept a large amount of responsibility for shaping his own course of study, but his adviser stands ready to assist him in all possible ways to make the most of the opportunities offered by the College.

## REQUIREMENTS FOR ADMISSION

An applicant for admission to the College of Arts and Sciences must have completed a secondary school course giving satisfactory preparation for the work of the College. Fifteen units of entrance credit are required, representing at least four years' work in a preparatory or high school. Of these fifteen units, three units (four years) shall be in English and two units in algebra covering elementary and intermediate algebra. The remaining units should normally be made up of foreign language (ancient or modern), science, and social studies (including history). Each candidate for admission is required to take the Scholastic Aptitude Test of the College Entrance Examination Board in January and to request the Board to report the result to the Director of Admissions, Cornell University.

All accepted applicants must take the English Achievement Test of the College Board not later than May for placement in class section. Those who wish to continue in Cornell a modern foreign language begun in secondary school must take the appropriate foreign language achievement test of the College Board not later than May. (See "Proficiency and Distribution Requirements, p. 17.")

Applicants for admission should consult the *General Information* booklet issued by the University. This publication contains more detailed information on entrance requirements, with notes on expenses, including tuition charges and fees, scholarships, loan funds, and matters of general interest to students. The *General Information* booklet and all other catalogues of Cornell University may be obtained by writing to Cornell University Official Publication, 336 Administration Building, Ithaca, N.Y. Application forms are to be had from the Director of Admissions, Administration Building, and communications concerning admission should be addressed to him.

Currently, the number of applicants exceeds the limited number admissible, and many eligible students must be denied entrance. A committee on admissions selects those who seem best qualified, after a comparative study not only of formal preparation but also of evidences bearing on each applicant's character, seriousness of purpose, and fitness to undertake the work of the College.

## ADMISSION TO ADVANCED STANDING

A student admitted to the College of Arts and Sciences from another college of Cornell University, or from any other institution of collegiate rank, will receive credit toward the degree of Bachelor of Arts for the number of hours to which his records may, in the judgment of the Faculty, entitle him. In order, however, to obtain the degree of Bachelor of Arts, he must, as a candidate for that degree, have been in residence at least two terms in the College of Arts and Sciences, and in that college only, and he must have completed a minimum of thirty hours while thus enrolled. Under present conditions only students with superior records may hope to be admitted with advanced standing, and preference is likely to be given to students with less than junior standing.

Freshmen in the College of Arts and Sciences may receive credit toward the degree of Bachelor of Arts for certain secondary subjects which are in excess of the minimum required for entrance by passing college-credit examinations in these subjects. Furthermore, freshmen may take college-credit examinations in subjects for which no entrance credits have been offered. Students are eligible to take these college-credit examinations *only* at entrance and at the end of their first term of residence in this college. In all cases, they must furnish the departments concerned with sufficient evidence of preparation to warrant the examinations requested.

## REGISTRATION IN COURSES

During an announced period before the opening of each term, every student will, with the aid of an adviser, prepare a program of studies. For the academic year 1951-52, registration for the fall term will be held in the period April 30 to May 9, 1951, and registration for the spring term will be held in the period November 26 to December 5, 1951. Program changes will be permitted during a limited period, for exceptional reasons only, without petition, upon the recommendation of the adviser. For the fall term, 1951, such changes may be made prior to August 15 by students whose schedules were submitted before August 1, and prior to September 1 by students whose schedules were submitted after August 1. For the spring term, 1952, such changes may be made prior to January 15. After these dates changes will be permitted, for extraordinary reasons only, by petition submitted during the first six days of instruction. Students failing to register during the announced periods or failing to make necessary changes within the period allowed

for changes may be subject to a \$2 fine unless a more extreme penalty is invoked.

No student will be permitted to cancel his registration in any course unless he shall have previously obtained from the Dean authorization to do so on the ground of ill health, or for any other cause beyond the student's control.

Entering freshmen, students transferring to the College, and students who have been absent on leave will have the opportunity to register by mail in the summer. Freshmen may expect a communication on the subject early in July from the Chairman of the Advisory Board for Underclassmen.

### ADVISERS

During the summer each entering freshman and re-entering underclassman will be assigned to a member of the Advisory Board for Underclassmen, which has jurisdiction over freshmen and sophomores until they have selected major advisers. The function of the underclass adviser is to assist the student in his choice of studies, to advise him during the term regarding his work, and to give him friendly counsel.

### SPECIAL PROGRAMS

The facilities of this college are intended primarily for students interested in a liberal arts education but are also available, by means of the following special programs, to students planning eventually to enter certain of the professions.

**PREPARATION FOR TEACHING** . . . Students planning to teach in the secondary school may combine the necessary professional preparation with other prescriptions of the College in satisfaction of the requirements for graduation. A fifth year of preparation is required for the permanent certificate in New York State.

Programs for such students have been arranged in English and public speaking, in foreign languages, in social studies, and in science and mathematics. Advice should be sought early regarding teaching opportunities in these subjects, combination of subjects usually required of teachers, choice of the major subject, and related matters.

Questions may be directed to Professor F. H. Stutz, Goldwin Smith Hall, Ithaca, N.Y., and to members of the advisory committee representing the various fields of concentration. New students interested in teaching are requested to confer with Professor Stutz in their first term of residence. (See also the *Announcement of the School of Education*.)

*PREMEDICAL STUDENTS* . . . All premedical students are requested to report once each semester to Professor L. L. Barnes, Rockefeller 155, who is the chairman of the Pre-Medical Advisory Board.

Certain minimum admissions requirements are prescribed by all medical schools. Since the most substantial of these requirements is in the field of chemistry, it is recommended that the freshman premedical student include chemistry in his course of study. Some freshman premedical students choose to take two sciences: either chemistry and zoology or chemistry and physics. Students who plan to make zoology their major subject will find it advantageous to include zoology in their freshman programs.

Medical educators are quite generally agreed that when a premedical student is planning his college course, he should not allow his interest in science to exclude studies in the humanities. They also agree that it would be unfortunate for the future of medicine if all premedical students were to take the same premedical course or major in the same subjects.

The Pre-Medical Advisory Board suggests the following first-semester program: English 111 (three hours), French or German (six hours), or Latin (three hours); chemistry (three hours). The remaining three to six hours should be chosen from the courses listed under "Courses Open to Freshmen" (p. 16).

*PRELEGAL STUDENTS* . . . All prelegal students are invited to consult with the members of the Law Faculty at any stage of their college course as to their election of subjects and in regard to any other matters pertinent to the legal career. Students taking the six-year combined Arts-Law course who are planning to enter the Law School upon completion of their work in this college should also confer with the Secretary of the Law School not later than their sophomore year.

*PREBUSINESS AND PUBLIC ADMINISTRATION* . . . The School of Business and Public Administration will give predominant weight to the quality of an applicant's previous academic record rather than to the particular courses which he has taken. But students who plan to enter the School are urged to include in their undergraduate programs basic courses in economics and American government. Students who expect to concentrate in accounting or statistics should take as much work in mathematics as is feasible. Students who intend to specialize in public administration should try to include a course in constitutional law in their undergraduate program prior to entering the School.



**PREPARATION FOR NURSING**... Students interested in nursing as a career will be assigned to Professor F. G. Marcham as adviser. A representative of the School of Nursing will come to the campus early in the first term for conferences with prospective applicants.

### NUMBER OF HOURS

An "hour" ordinarily represents attendance once a week at lecture or recitation, or at a laboratory exercise lasting two hours and a half or three hours.

A freshman will usually register in his first term for fifteen hours of work, in addition to the required hours in physical training and military science (see p. 24).

Every student must register in each term for at least twelve academic hours (including naval science but excluding military science and physical training). Underclassmen may register for no more than seventeen academic hours, in any case for no more than five courses, except by permission of the Dean. Freshmen and sophomores however, may carry a total of eighteen hours when the total includes an advanced course in military science. No upperclassman may register for more than eighteen hours in any term except by permission of the Dean, which will normally be granted, on petition, only to students who have achieved an average grade of 80 or better in previous work. In addition to the required work in physical training and military science, a student on probation may not register for more than fifteen academic hours a term.

### COURSES OPEN TO FRESHMEN

*See also "Proficiency and Distribution Requirements," p. 17.*

The following are the courses in the College of Arts and Sciences regularly open to freshmen, except that (1) a student may not register for any course for which he has not satisfied the prerequisites, if any are specified (see announcement under each course); (2) a student may not register for any course for which he has presented an acceptable equivalent at entrance. In the section, "Courses of Instruction," the courses open to freshmen are identified by asterisks.

Astronomy 101, 102, 125, 127, 128  
Biology 1  
Botany 1  
Chemistry 101-102, 105-106,

111-112, 115, 201, 212  
Chinese 101, 102, 103, 201, 203  
Economics 101, 105-106  
English 111-112, 221-222



Fine Arts 101-102, 111-112	154, 161-162, 171-172
French 101, 102, 103, 201, 203, 301-302	Music 101, 102, 106, 108, 103- 104, 401-402, 405-406
Geology 101-102, 105, 108, 111, 115	Philosophy 101, 102, 103
German 101, 102, 103, 105, 301- 302	Physics 103, 104, 107, 108
Government 101, 102, 104	Physiology 303
Greek 101, 103, 201, 203	Portuguese 101, 102, 103, 201, 203
History 101-102, 103-104, 107- 108	Psychology 101, 102, 106, 108, 112
Italian 101, 102, 103, 201, 203	Russian 101, 102, 103, 201, 203
Latin 105-106, 107, 109-110, 111-112	Sociology 101, 103, 104
Literature 101-102	Spanish 101, 102, 103, 201, 203, 301-302
Mathematics 121-122, 133, 153-	Speech and Drama 131, 133
	Zoology 101-102

## PROFICIENCY AND DISTRIBUTION REQUIREMENTS

Before graduation each student must satisfy the following subject matter requirements:

### A. PROFICIENCIES

1. English, by completing 111-112. This course must be begun in the first year of residence. Students demonstrating in class work and by examination a high level of accomplishment in English 111 may be exempted from English 112. Foreign students may satisfy the requirement by offering English 211, for which the prerequisite is satisfaction of the proficiency requirement as defined by the Division of Modern Languages.

2. Foreign Language. Each student must demonstrate proficiency in one foreign language, ancient or modern. In the ancient languages (Latin, Greek), the requirement may be met by the successful completion of Latin 110 or 112, or Greek 203. In the modern languages the requirement is met, not by taking any specific amount of course work, but rather by passing the appropriate proficiency examination given by the Division of Modern Languages. This examination consists of the College Board Achievement Test (or its equivalent) plus the Cornell Auditory Test (in the appropriate language); both parts are given at the end of each term (as the final examination of Course 102),

and also on November 14 and April 16 of the 1951-52 academic year. Students who pass Course 102 but fail the proficiency examination may satisfy the language requirement by completing Course 103 (in German, Course 103 or 105).

Students wishing to begin a modern language they have not previously studied may register for Course 101 in that language. Those entering Cornell who wish to continue a modern language they have already studied in school or another college must take the College Board Achievement Test in that language. On the basis of this test they will (1) be placed in Course 101; (2) be placed in Course 102; or (3) be declared proficient. Students who have not taken the College Board Achievement Test before entrance may not continue the study of a language until they have taken the proficiency examination administered by the Division of Modern Languages. This is necessary in order that they may be placed in the proper course.

A student who enters from a foreign country, and whose mother tongue is not English, will satisfy the foreign language requirement by demonstrating competence in English, which shall be defined for the purpose as a modern foreign language.

#### B. DISTRIBUTION REQUIREMENTS:

*In each of the three groups of courses following a student is required to earn six hours of credit by passing one of the indicated six-hour sequences:*

##### 1. LABORATORY SCIENCE:

Astronomy 101, 102

Biology 1

Botany 1

Chemistry 101-102; 105-106

Geology 101-102

Physics 103, 104; or the equivalent

Zoology 101-102

##### 2. HISTORY:

History 101 and 102; 103-104; 107-108; 115-116; 151-152

##### 3. LITERATURE:

English 221-222; 251-252; or 329-330

Far Eastern Studies 351-352

French 301-302

German 301-302, 305-306; or 365-366

Greek 201-203

Italian 307-308

Latin 110 and 205; or 112 and 205

Literature 101-102; 201-202; 211-212; 301-302; 311-312; or 321-322

Russian 301-302

Spanish 301-302; or 303-304

*From the following groups (4-8), a student must pass TWO of the indicated six-hour sequences. Only one sequence may be selected from any group.*

#### 4. MATHEMATICS OR A SECOND SCIENCE:

Mathematics 121-122 or any six hours of more advanced courses

Science (a second science chosen from the list in Group 1 above; students who have chosen a *Physical Science* will take a *Biological Science*, and vice versa)

#### 5. PHILOSOPHY:

Philosophy 101-102; 221-222; 301-302; or 321-322

#### 6. ECONOMICS OR GOVERNMENT:

Economics 101; or 105-106

Government 101, and 102 or 104

#### 7. PSYCHOLOGY OR SOCIOLOGY AND ANTHROPOLOGY:

Psychology 101 and one of the following: 102, 103, 106, 107, 108 or 112

Sociology and Anthropology 101 or 103 and one of the following: 102, 104, 301, 431, 520 or 611

#### 8. FINE ARTS, MUSIC, OR SPEECH AND DRAMA:

Fine Arts 101-102

Music 101 and one of the following: 102, 106 or 108

Speech and Drama, six hours chosen from Courses 175, 401, 455, 475

### MAJOR SUBJECTS

1. *Selection of Major Subject and Adviser.* Before the end of the second year of residence, a student *must* select his major subject from options listed below. He must at the same time choose as his major adviser a designated representative of the program selected. During the remainder of his residence, he will consult with his major adviser in

arranging his course and must obtain his signature on the study card before it is filed in the Dean's office.

American Studies	
Astronomy	Government
Botany	History
Chemistry	Italian Literature
Classics	Literature
Classical Civilization	Mathematics
Economics	Music
English	Philosophy
Far Eastern Studies	Physics
Fine Arts	Psychology
French Linguistics	Russian Linguistics
French Literature	Sociology and Anthropology
Geology	Spanish Linguistics
German Linguistics	Spanish Literature
German Literature	Speech and Drama
German Studies	Zoology

2. *Major Requirements.* Before graduation, a student must complete courses which satisfy the requirement in his major subject. A statement of this requirement, indicating courses and total hours required, appears before the list of courses in each of the subject divisions. The student must also meet the stated requirement of courses in related subjects. No student may count toward the one hundred and twenty hours required for graduation more than forty-eight hours in courses offered by a single department, with the following exceptions: the first six hours of intensive courses in modern languages and the first twelve hours of nonintensive courses for beginners in Latin and Greek. If a comprehensive examination is included in the requirements of the major subject, this must be passed before graduation. Courses completed before the selection of the major subject, including those offered in satisfaction of the prescriptions of the College, may be accepted in partial fulfillment of these requirements.

Upon recommendation of the major adviser, the Dean may excuse a student registered simultaneously in this college and in another college of the University from not more than eighteen hours of his major requirements.

3. *Informal Study.* The major requirements in certain subjects may be satisfied in part by informal study. In those subjects in which in-

formal study is arranged a statement to this effect appears before the list of courses. Departments may require informal study of some or all of their major students or may admit them upon application.

Informal study will consist of reading, reports, experimentation, senior theses, or other work intended to require from the student the expression of initiative in his major subject or in a related field approved by his adviser. This work will be supervised by the major adviser or by a member of the instructing staff approved by him and may be tested by examination at the option of the department.

A student who has sixty credit hours is eligible for informal study. He may earn credit by this means to the amount of six hours in the junior year and of twelve in the senior year. A student desiring to do informal study outside his major department must secure the approval of the Faculty member under whom he proposes to work and of his adviser; he will then submit a petition to the Dean.

## CREDIT FOR SUMMER SESSION

Credit for work done in summer sessions at Cornell or elsewhere may be granted to the extent of thirty hours. To secure credit for work done elsewhere, a student must be in good standing. Petitions for credit must be approved by the adviser and filed in the Dean's office prior to *June 1*; there they will be considered and acted upon in accordance with their merits.

## DOUBLE REGISTRATION

A student who has completed at least ninety hours in courses given in the College of Arts and Sciences including the prescribed subjects and proficiencies and the major may, with the permission of the faculties concerned, be registered both in the College of Arts and Sciences and in the Cornell University Medical College or the Cornell Law School, or the College of Veterinary Medicine, or the School of Business and Public Administration. (See "Major Subjects," 2, p. 19.) It should be noted, however, that admission to the Medical College is closely restricted and that in recent years the Medical College was able to grant this privilege of double registration to only a very small proportion of the fourth-year students of the College of Arts and Sciences who applied and who were formally eligible for it.

Consult also the italicized statements by the several departments under "Courses of Instruction" (pp. 28 ff.).



## MARKS AND SCHOLASTIC DISCIPLINE

The passing grade is 60; the mark *abs.* represents a course left incomplete by a student's absence from the final examination; *inc.* represents a course left incomplete for other reasons acceptable to the instructor; Z, a course from which a student withdrew without an official cancellation.

No credit toward graduation will be given for a course in which a mark of less than 60 or in which one of Z is recorded, unless the course be repeated and a passing mark received. A student who has received a mark between 50 and 59, inclusive, in any course that is a prerequisite of any other course may, at the discretion of the department concerned, be regarded as having satisfied the prerequisite.

A student who, in any course, has received a term mark of *inc.* or of *abs.* may, with the consent of the Dean, and upon payment of the fee required by the University, be permitted to remove the mark, by examination or otherwise, as the department concerned may direct. A mark of incomplete or of absent may not be removed later than registration day of the third term of attendance in the University, dating from the time the course was taken, and no more than one attempt at removal will be allowed.

A student who in any term does not pass twelve hours (excluding courses in basic military science and physical training), with a grade of 70 or better in at least nine of the twelve hours, will be either dropped from the College or placed upon probation. Students on probation may not register in any summer session other than the Cornell Summer Session with the expectation of receiving credit in this College.

Students failing to make normal progress in fulfilling the requirements in military science and physical training will be placed on probation or dismissed from the College.

A student's general record may be so unsatisfactory that the Faculty will refuse him permission to continue in the College even though he has passed twelve hours in the preceding term.

A student failing in the last term, or summer session, of his senior year to meet the requirements in hours and grades described above, will ordinarily be expected to return for another summer session wherein he will be required to make a satisfactory record before he will be graduated.



## REQUIREMENTS FOR GRADUATION

The College of Arts and Sciences offers one degree only, the Bachelor of Arts. This degree will not be conferred upon any student who has not been in residence at Cornell during the last two terms preceding graduation, and registered in the College of Arts and Sciences, nor upon any student who has not been in residence during at least two terms in the College of Arts and Sciences and in this college only.

### BACHELOR OF ARTS

A candidate must meet the following requirements for the degree of Bachelor of Arts:

1. Credit for one hundred and twenty hours, of which at least ninety hours must be for courses given in the College of Arts and Sciences. Elementary courses in military science and physical training, which are offered under the jurisdiction of the University, but not of any College, *may not* be counted as part of the thirty hours which a student may elect outside the College of Arts and Sciences, nor as part of the ninety hours required in the College. However, advanced courses in military and air science and tactics *may* be counted in the thirty hours allowed outside this College, to a maximum of twelve hours. Certain courses in naval science and tactics are also open to civilian students in the College of Arts and Sciences who secure permission to register from the Professor of Naval Science and Tactics. (See also the *Announcement of the Independent Departments.*)

2. A grade of 70 or better in at least seventy-two of the required one hundred and twenty hours.

At least three-fifths of the hours in the major subjects must be passed with a grade of 70 or better.

3. Election of courses in accordance with "Proficiency and Distribution Requirements," p. 17.

4. Completion of the work in military science and physical training as prescribed by the University Faculty (see below).

### BACHELOR OF ARTS WITH DISTINCTION

The degree of Bachelor of Arts with Distinction in the field of a student's major subject will be conferred upon those students who, in addition to having completed the requirements for the degree of Bachelor of Arts, shall (1) have received a grade of 85 or better in at least sixty hours of the courses for which they have been enrolled, and

an average of 85 in the courses for which they have been enrolled in the field of their major subject and its related courses; (2) have, at the option of the department, taken and passed with distinction a comprehensive examination in the major subject; (3) have been recommended for the said degree by the department representing their major subject.

The degree of Bachelor of Arts with Distinction in all subjects will be conferred upon those students who, in addition to having completed the requirements for the degree of Bachelor of Arts, shall (1) have received the grade of 80 or better in at least ninety hours of courses, and of 90 or better in at least sixty of these; (2) not have received a grade below 70 in more than one course; (3) have received no marks lower than 60. To qualify for the degree of Bachelor of Arts with Distinction in all subjects, a candidate must have completed at least sixty hours at Cornell in courses taught in the College of Arts and Sciences; and if he has received credit toward his degree for work done in another institution, the requirement of grades shall be prorated for the residue of work which must be completed in Arts and Sciences at Cornell.

#### UNIVERSITY REQUIREMENTS IN MILITARY SCIENCE AND PHYSICAL TRAINING

*MILITARY SCIENCE* . . . All physically qualified undergraduate men who are American citizens must take military science during their first four terms. Enrollment in the basic course of military science and tactics or air science and tactics, or in the first two years of naval science, satisfies this requirement. Students transferring to Cornell from other institutions are exempt from part or all of the requirement, according to the number of terms of residence in college before transfer; and service in the armed forces in World War II also satisfies the military training obligation. Entering students, who have had ROTC training in secondary or military schools, are requested to bring WD AGO Form 131 — Student's Record for presentation to the Military Department at the time of registration. (See also the *Announcement of the Independent Departments*.)

Credit in advanced courses in the Army or Air ROTC programs to the extent of twelve hours may be counted in the thirty hours allowed outside the College.

In the Naval ROTC program eighteen hours may be counted toward the one hundred and twenty hours required for the degree as follows: Naval Science 301 and 302, three hours each, may be counted within

the ninety Arts hours; and Naval Science 201, 202, 401 and 402, three hours each, may be counted in the thirty hours allowed outside the College.

*PHYSICAL TRAINING*...All undergraduates must pursue four terms of work, three hours a week, in physical training. This requirement must be completed in the first two years of residence; postponements are to be allowed only by consent of the University Faculty Committee on Requirements for Graduation.

Exemption from this requirement may be made by the Committee designated above, when it is recommended by the Medical Office, by the Department of Physical Education, or because of unusual conditions of age, residence, or outside responsibilities. An exemption recommended by the Department of Physical Education shall be given only to students who meet standards of physical condition established by the Department of Physical Education and approved by the Committee on Requirements for Graduation. Students who have been discharged from the armed services may be exempted.

For students entering with advanced standing, the number of terms of physical training required is to be reduced by the number of terms which the student has satisfactorily completed (whether or not physical training was included in his program) in a college of recognized standing. (See also the *Announcement of the Independent Departments*.)

## HEALTH SERVICES AND MEDICAL CARE

These services are centered in the University Clinic or out-patient department and in the Cornell Infirmary or hospital. Students are entitled to unlimited visits at the Clinic; laboratory and X-ray examinations indicated for diagnosis and treatment; hospitalization in the Infirmary with medical care for a maximum of fourteen days each term and emergency surgical care. The cost for these services is included in the College and University general fee. For further details, including charges for special services, see the *General Information* booklet.

## SCHOLARSHIPS AND PRIZES

Scholarships and prizes open to students of Arts and Sciences as members of the University are listed in the *General Information* booklet and in the booklets *Prize Competitions* and *Scholarships and Grants-in-Aid*. Only students of Arts and Sciences are eligible for the scholarships and prizes described below.

*THE GEORGE C. BOLDT MEMORIAL SCHOLARSHIPS*... Mr. George C. Boldt, Jr., has created three scholarships, each of them worth \$400, as a memorial to his father. These scholarships will be awarded at the close of the junior year to the three men students of the College who shall be considered most deserving of this aid. Applications for these scholarships must be filed in the office of the Dean before March 15 of the academic year preceding the year for which they are awarded. Students enrolled both in this College and in the Law School, the Medical College, or the Graduate School are not eligible.

*CHESTER BUCHANAN MEMORIAL SCHOLARSHIP*... A gift of Mrs. Claire F. Buchanan, in memory of her son, Chester Buchanan, carries an annual stipend of \$60. It is awarded each year on the recommendation of the Department of Geology to the outstanding male senior who is majoring in this subject.

*THE CORNELIA L. HALL SCHOLARSHIP*... A gift of the late Mary F. Hall has established the Cornelia L. Hall Scholarship, worth \$120, "open to any meritorious young woman of this State, who is pursuing the studies of the A.B. course and who is in need of financial assistance." Under the terms of the bequest, preference must be given to a suitable candidate from Tioga, Tompkins, or Chemung County; within this preferred class, women of senior or junior standing will be regarded as entitled to first consideration. Applications for the scholarship must be filed in the office of the Dean before March 15 of the academic year preceding the year for which it is awarded.

*THE GEORGE CHAPMAN CALDWELL PRIZE*... The George Chapman Caldwell Prize of \$50, established in 1913, is awarded, for general excellence in Chemistry, by the staff of the Department of Chemistry to a member of the senior class in Arts with a major in Chemistry.

*THE BESS BERLOW COHAN PRIZE*... The Bess Berlow Cohan Prize of \$100, established in 1939, is awarded by a committee to the member of the senior class who has shown the greatest ability and progress in a combined study of Classics and English.

*THE JULIETTE MacMONNIES COURANT PRIZE*... The Juliette MacMonnies Courant Prize, founded by Mrs. Margaret MacMonnies Courant in memory of her daughter, consists of about \$40, either in cash or books as the recipient may determine. It is awarded annually to that woman student of the senior class whose major subject is French

and who shall, in the opinion of the committee of award, have made the best record in her four years of work, with especial reference to facility of expression in French.

*THE DUNIWAY PRIZE* . . . The Duniway Prize, founded by a bequest of the late Clyde A. Duniway, will be awarded annually to the best senior majoring in History or in Government and shall consist of books in the fields of History and Government to the value of approximately \$30. In selecting the winning candidate, the committee of award shall take into account his academic record, his ability to express himself clearly and idiomatically in speaking and writing, and his scholarly approach.

*THE HAROLD ADLARD LOVENBERG PRIZE* . . . The Harold Adlard Lovenberg Prize of \$40, established in 1939, is awarded for general excellence, by the staff of the Department of Chemistry to a member of the junior class in Arts with a major in Chemistry.



## *Courses of Instruction*

THE following list of courses will be offered in the academic year 1951-52. Courses numbered from 100 to 200 are, in general, introductory and may not be offered, save when so specified by the departments concerned, in partial satisfaction of major requirements. Branches or divisions of a subject are usually indicated through use of the hundreds place digit from 2 to 9 inclusive. Courses primarily for graduates, but open to undergraduates under certain conditions, bear numbers 75 or larger—Geology 395-396, Philosophy 575-576, etc. The student should read carefully the italicized statements preceding the offerings of each department and division in which he selects courses.

A list of rooms in which all lectures, recitations, and laboratory exercises are to be held will be distributed before the commencement of instruction.

### AMERICAN STUDIES

Mr. HENRY A. MYERS, *Chairman*; Messrs. G. P. ADAMS, JR., M. L. HULSE, ARTHUR E. MURPHY, C. P. NETTELS, CLINTON L. ROSSITER, R. M. WILLIAMS, JR.

*For a major in American studies, consult Mr. MYERS.*

*For a major in American studies the student is required to complete one of the following programs:*

#### *1. Major in American Studies with a Concentration in Economics*

Government 101. *AMERICAN NATIONAL GOVERNMENT*. Three additional hours in American government.

History 151-152. *AMERICAN HISTORY*.

English 329-330. *AMERICAN LITERATURE*.

Philosophy 313. *AMERICAN PHILOSOPHY*.

*AMERICAN PAINTING*. (Arch. 424)

Sociology and Anthropology 431-432. *STRUCTURE AND FUNCTIONING OF AMERICAN SOCIETY*.

Economics 105-106. *MODERN ECONOMIC SOCIETY*.

*12 additional hours elected from the following courses:*

Economics 203-204. *MONEY, CURRENCY, AND BANKING*.

Economics 224. *THE SYSTEM OF MONEY FLOWS IN THE UNITED STATES*.

Economics 231. *FINANCIAL HISTORY OF THE UNITED STATES*.



Economics 321. *PRIVATE ENTERPRISE AND PUBLIC POLICY.*  
 Economics 322. *PUBLIC REGULATION OF BUSINESS.*  
 Economics 401. *LABOR CONDITIONS AND PROBLEMS.*  
 Economics 402. *TRADE UNIONISM AND COLLECTIVE BARGAINING.*  
 Economics 411. *LEGAL AND CONSTITUTIONAL ASPECTS OF LABOR PROBLEMS.*  
 Economics 902. *NATIONAL INCOME AND WEALTH.*  
 Economics 920. *FULL EMPLOYMENT AND FREE ENTERPRISE.*

Interdepartmental Seminar (senior year).  
 Informal Study (senior year).

### *2. Major in American Studies with a Concentration in Government*

Economics 105-106. *MODERN ECONOMIC SOCIETY.*  
 History 151-152. *AMERICAN HISTORY.*  
 English 329-330. *AMERICAN LITERATURE.*  
 Philosophy 313. *AMERICAN PHILOSOPHY.*  
*AMERICAN PAINTING.* (Arch. 424)  
 Sociology and Anthropology 431-432. *STRUCTURE AND FUNCTIONING OF AMERICAN SOCIETY.*  
 Government 101. *AMERICAN NATIONAL GOVERNMENT.*

*15 additional hours elected from the following courses:*

Government 102. *STATE AND LOCAL GOVERNMENT.*  
 Government 213. *CONGRESS.*  
 Government 216. *THE AMERICAN PRESIDENCY.*  
 Government 218. *AMERICAN POLITICAL PARTIES.*  
 Government 231-232. *PUBLIC ADMINISTRATION.*  
 Government 235. *AMERICAN POLITICAL AND CONSTITUTIONAL THEORY.*  
 Government 241-242. *CONSTITUTIONAL LAW.*  
 Government 417. *CONTEMPORARY AMERICAN FOREIGN POLICY: THE FAR EASTERN POLICY OF THE UNITED STATES.*

Interdepartmental Seminar (senior year).  
 Informal Study (senior year).

### *3. Major in American Studies with a Concentration in History*

Economics 105-106. *MODERN ECONOMIC SOCIETY.*  
 Government 101. *AMERICAN NATIONAL GOVERNMENT.* Three additional hours in American government.  
 English 329-330. *AMERICAN LITERATURE.*  
 Philosophy 313. *AMERICAN PHILOSOPHY.*  
*AMERICAN PAINTING.* (Arch. 424)  
 Sociology and Anthropology 431-432. *STRUCTURE AND FUNCTIONING OF AMERICAN SOCIETY.*  
 History 151-152. *AMERICAN HISTORY.*

*12 additional hours elected from the following courses:*

History 711. *AMERICAN COLONIAL HISTORY TO 1763.*

History 712. *THE AGE OF WASHINGTON, 1763-1800.*

History 717. *AMERICAN BIOGRAPHY.*

History 721-722. *AMERICAN HISTORY: HISTORY OF THE WEST.*

History 726. *RECENT AMERICAN HISTORY.*

Interdepartmental Seminar (senior year).

Informal Study (senior year).

#### *4. Major in American Studies with a Concentration in Literature*

Economics 105-106. *MODERN ECONOMIC SOCIETY.*

Government 101. *AMERICAN NATIONAL GOVERNMENT.* Three additional hours in American government.

History 151-152. *AMERICAN HISTORY.*

Philosophy 313. *AMERICAN PHILOSOPHY.*

*AMERICAN PAINTING.* (Arch. 424)

Sociology and Anthropology 431-432. *STRUCTURE AND FUNCTIONING OF AMERICAN SOCIETY.*

English 329-330. *AMERICAN LITERATURE.*

*12 additional hours elected from the following courses:*

English 335. *THE MODERN AMERICAN NOVEL.*

English 349. *RECENT AMERICAN POETRY.*

English 355. *AMERICAN FOLK-LITERATURE.*

English 376. *AMERICAN COLONIAL LITERATURE.*

English 377. *EMERSON, THOREAU, AND WHITMAN.*

English 379. *POE, HAWTHORNE, AND MELVILLE.*

English 380. *MARK TWAIN, HOWELLS, AND JAMES.*

Speech and Drama 283. *AMERICAN ORATORS.*

Speech and Drama 455. *AMERICAN DRAMA AND THEATRE.*

Interdepartmental Seminar (senior year).

Informal Study (senior year).

#### *5. Major in American Studies with a Concentration in Sociology and Anthropology*

Economics 105-106. *MODERN ECONOMIC SOCIETY.*

Government 101. *AMERICAN NATIONAL GOVERNMENT.* Three additional hours in American government.

History 151-152. *AMERICAN HISTORY.*

English 329-330. *AMERICAN LITERATURE.*

Philosophy 313. *AMERICAN PHILOSOPHY.*

*AMERICAN PAINTING.* (Arch. 424)

Sociology and Anthropology 431-432. *STRUCTURE AND FUNCTIONING OF AMERICAN SOCIETY.*

Sociology and Anthropology 311. *PUBLIC OPINION.*

Sociology and Anthropology 320. *POLITICAL SOCIOLOGY.*

Sociology and Anthropology 433. *AMERICAN ECONOMIC CLASSES*.  
Sociology and Anthropology 520. *PROBLEMS IN MINORITY GROUP RELATIONS*.

Interdepartmental Seminar (senior year).

Informal Study (senior year).

*In addition, the student is advised to consider, as possible electives, a three-hour course in American Education and a three-hour course in American Geography.*

*Courses in Literature and History offered by the student in satisfaction of the College requirements may not be offered in satisfaction of the requirements of the major in American Studies.*

## ASTRONOMY

Mr. R. W. SHAW, *Chairman*; Miss M. E. STAHR.

*For a major in Astronomy the following courses must be completed: (1) in Astronomy, Courses 101 and 102, twelve hours of Interpretational Astronomy, six hours of Observational Astronomy, six hours of electives; (2) in related subjects, at least fifteen hours selected from approved courses in Chemistry, Geology, Mathematics, and Physics. Students who anticipate a major in Astronomy should complete Astronomy 101 and 102 not later than the sophomore year.*

\*101. *INTRODUCTION TO ASTRONOMY*. Fall term. Credit three hours. Lectures, T Th 11. Laboratory, M T W Th 2-4:30. Mr. SHAW.

Fundamentals of astronomy with emphasis on the planets, moon, comets, meteors, the solar system as a unit, and telescopes. Observation at Fiertes Observatory.

\*102. *INTRODUCTION TO ASTRONOMY*. Spring term. Credit three hours. Lectures, T Th 11. Laboratory, M T W Th 2-4:30. Mr. SHAW.

Fundamentals of astronomy with emphasis on the sun, the stars, the galaxy, the sidereal universe, and spectroscopy. Observation at Fiertes Observatory.

\*[125. *AIR NAVIGATION*. Fall term. Credit three hours. Mr. SHAW. Not offered in 1951-52.]

\*127. *NAVIGATION AND NAUTICAL ASTRONOMY I*. Fall term. Credit three hours. Prerequisite, plane trigonometry. M W F 9. Mr. SHAW.

Piloting, dead reckoning and radio navigation. Theory of charts, aids to navigation, gyro and magnetic compasses. Tides and currents. Practice in navigational techniques.

\*128. *NAVIGATION AND NAUTICAL ASTRONOMY II*. Spring term. Credit three hours. Prerequisite, plane trigonometry. M W F 9. Mr. SHAW.

Celestial navigation. Theory of position determination on sea and in air. Air and nautical almanacs. Practice with marine, standard bubble and automatic sextants. Chart work. Electronic navigation including radar, loran, and other specialized techniques.

## INTERPRETATIONAL ASTRONOMY

[221. *ORIGIN OF THE SOLAR SYSTEM*. Fall term. Credit three hours. Prerequisites, the Calculus and the consent of the instructor. Mr. SHAW. Not offered in 1951-52.]

226. *THEORY OF ORBITS*. Spring term. Credit three hours. Prerequisites, the Calculus and the consent of the instructor. M W F 12. Miss STAHR.

Theory of objects moving according to Newton's Law of Gravitation. Computation of the elements of the orbit of a comet or asteroid from three or more observations.

[231. *STELLAR STRUCTURE*. Spring term. Credit three hours. Prerequisites, the Calculus and the consent of the instructor. Mr. SHAW. Not offered in 1951-52.]

238. *ASTROCHEMISTRY*. Spring term. Credit three hours. Prerequisites, the Calculus and the consent of the instructor. M W F 11. Mr. SHAW.

Chemical and physical structure of celestial objects. Behavior of matter under extremes of temperature and pressure. Formation of spectral lines and the quantitative analysis of stellar atmospheres. Formation of molecules and molecular aggregates. Atomic transformations and the origin of the elements.

241. *THE GALAXY*. Fall term. Credit three hours. Prerequisites, the Calculus and the consent of the instructor. M W F 12. Miss STAHR.

A study of the Milky Way, its components, dimensions, age, and internal motions. Critical consideration of the observations which are the source of our information. Application of statistical mathematics to astronomical problems.

[244. *EXTERNAL GALAXIES*. Spring term. Credit three hours. Prerequisites, the Calculus and the consent of the instructor. M W F 12. Miss STAHR. Not offered in 1951-52.]

259. *SPECIAL TOPICS IN ASTRONOMY*. Fall or spring term. Credit one to three hours. Prerequisite, consent of the instructor. STAFF.

Qualified students may receive instruction in special topics selected according to their needs and preparation.

## OBSERVATIONAL ASTRONOMY

[461. *ASTRONOMICAL SPECTROSCOPY*. Fall term. Credit three hours. Prerequisite, consent of the instructor. Mr. SHAW. Not offered in 1951-52.]

[464. *ASTROMETRY*. Spring term. Credit three hours. Prerequisite, consent of the instructor. Miss STAHR. Not offered in 1951-52.]

[468. *PRACTICAL ASTRONOMY*. Spring term. Credit three hours. Prerequisite, consent of the instructor. Mr. SHAW. Not offered in 1951-52.]

## BOTANY

Mr. LEWIS KNUDSON, *Chairman*; Messrs. H. P. BANKS, D. G. CLARK, R. T. CLAUSEN, W. C. MUENSCHER, L. C. PETRY, L. F. RANDOLPH, F. C. STEWARD, C. H. UHL.

*For a major in Botany the student must complete courses 1 and 117 and two of the following courses: 31, 123, 124, 126, 127; and in addition one course of three or four hours' credit in the field of Botany. In related subjects eighteen hours must be selected from approved courses in Bacteriology, Biochemistry, Chemistry, Entomology, Geology, Physics, Plant Pathology, and Zoology. Plant Breeding 101 may be offered either as a course in Botany or in the related subjects.*

*For a major in Botany with advanced work in Bacteriology, the following courses must be completed: (1) in Botany, Courses 1, 31, 117; in Bacteriology, eight hours of advanced courses approved by the Department of Botany; (2) in related subjects, eighteen hours to be selected from the list given in the paragraph above.*

*Provisions are made for a limited number of students to undertake informal study.*

\*1. **GENERAL BOTANY.** Throughout the year. Credit three hours a term. If taken after general biology, credit two hours a term. Lectures, T Th 9 or 11. Laboratory, M T W Th or F 2-4:30; and some morning sessions to be arranged. Mr. PETRY and instructors.

A survey of the fundamental facts and principles of plant life. The work of the first term deals with the structures and functions of the higher plants, with special emphasis on their nutrition. The work of the second term traces the evolution of the plant kingdom, as illustrated by representatives of the principal groups, and concludes with a brief introduction to the principles of classification of the flowering plants.

31. **PLANT PHYSIOLOGY.** Either term. Credit four hours. Prerequisite, Botany 1, or biology, and introductory chemistry. Lectures, T Th 10. Laboratory, T Th 2-4:30, W F 2-4:30, or M 2-4:30, S 8-10:30. Mr. KNUDSON.

This course is designed to acquaint the student with the general principles of plant physiology. Topics such as water relations, photosynthesis, translocation, digestion, respiration, mineral nutrition, growth, and reproduction are studied in detail. Particular emphasis is placed, both in laboratory and in classroom, on discussion of principles and their application to plants.

55. **WEEDS AND POISONOUS PLANTS.** Fall term. Credit three hours. Prerequisite, Botany 1 or its equivalent. Lectures, F 9. Laboratory, W F 2-4:30. Mr. MUENSCHER and assistant.

Special emphasis is given to the habits, characteristics, and properties which make weeds and poisonous plants harmful or undesirable, the losses and injury produced by them, and the methods for their prevention, eradication, and control.

115. **AQUATIC PLANTS.** Spring term. Credit three hours. Prerequisite, Botany 1 or its equivalent. Lecture, M 9. Laboratory, M W 2-4:30. Mr. MUENSCHER.

A study of the taxonomy and ecology of fresh-water plants, beginning with the algae and concluding with the aquatic angiosperms.

117. **TAXONOMY OF VASCULAR PLANTS.** Fall term. Credit four hours. Prerequisite, Botany 1 or its equivalent. Mr. CLAUSEN. Lectures, T Th 9. Plant Science 143. Laboratory, T Th 2-4:30.

A survey of the families of ferns and seed plants, their gross morphology, geographical distribution, and economic importance, together with an introduction to the principles and literature of taxonomy. Methods of identification are stressed.

118. **TAXONOMY OF VASCULAR PLANTS, ADVANCED COURSE.** Spring term. Credit four hours. Prerequisite, Botany 117 and either Botany 124 or Plant Breeding 101. Lectures, T Th 9. Laboratory, T Th 2-4:30. Plant Science 211. Mr. CLAUSEN.

A continuation of Course 117, including a consideration of evolutionary patterns in the ferns and seed-plants; a demonstration of the principles and methods of taxonomy; and an introduction to problems of classification in the flora of North



America. Trips will be scheduled in laboratory periods and on several Sundays in the second half of the term.

123. *PLANT ANATOMY*. Fall term. Credit four hours. Prerequisite, Botany 1 or its equivalent and permission to register. Mr. BANKS. Lectures, T Th 9. Laboratory, either T 10-12:30, Th 10-11:30, and S 9-11:30, or M 2-4:30, W 2-3:30, and F 2-4:30.

A detailed study of the internal structure of vascular plants with emphasis on determination and interpretation.

124. *CYTOLOGY*. Fall term. Credit four hours. Prerequisite, Botany 1 or Zoology 101-102 or its equivalent. Lectures, M W 9. Laboratory, M W or T Th 10-12:30. Assignment to laboratory section must be made at time of registration. Mr. UHL.

The principal topics considered are protoplasm, cells and their components, nuclear and cell division, meiosis and fertilization, and the relation of these to the problems of development, reproduction, taxonomy, and heredity. Both plant and animal materials are used.

125. *MICROTECHNIQUE*. Spring term. Credit two hours. Prerequisites, Botany 1 and permission to register. Mr. UHL. Hours to be arranged.

A laboratory course in methods of preparing plant material for microscopical study.

126. *MORPHOLOGY OF VASCULAR PLANTS*. Spring term. Credit three hours a term. Prerequisites, Botany 1 or its equivalent, and permission to register. Mr. BANKS. Lectures, M W 11. Laboratory, M W 2-4:30.

An advanced course in the comparative morphology, life histories, and phylogeny of the lower vascular plants, both fossil and recent.

[127. *MORPHOLOGY OF VASCULAR PLANTS*. Spring term. Credit three hours a term. Prerequisites, Botany 1 or its equivalent, and permission to register. Mr. BANKS. Given in alternate years. Not given in 1951-52.]

An advanced course in the comparative morphology, life histories, and phylogeny of the higher vascular plants, both fossil and recent.

171. *SPECIAL PROBLEMS IN GENERAL BOTANY, TAXONOMY, MORPHOLOGY, ANATOMY, PALEOBOTANY, ECONOMIC BOTANY, CYTOLOGY, AND PHYSIOLOGY*. Throughout the year. Credit not less than two hours a term. Hours by appointment.

Students engaged in special problems or making special studies may register in this course. They must satisfy the instructor under whom the work is taken that their preparation warrants their choice of problem.

217. *SEMINAR IN TAXONOMY OF VASCULAR PLANTS*. Fall and spring terms. Required of graduate students taking work in taxonomy. Conference, M 4:30. Mr. CLAUSEN.

A consideration of current research and literature; reports on problems of research by graduate students and members of the staff.

224. *CYTOGENETICS*. Spring term. Credit three hours. Prerequisites, Botany 124 and Plant Breeding 101 or their equivalent. Lectures, M W 9. Laboratory, M or W 10-12:30. Mr. RANDOLPH.

An advanced course dealing mainly with the chromosome mechanism of heredity and with recent researches in cytology, cytotaxonomy, and cytogenetics.

231. *PLANT PHYSIOLOGY, ADVANCED LECTURE COURSE.* Throughout the year. Credit three hours a term. Limited to seniors and graduate students. Prerequisite, training in Botany and Chemistry, to be determined in each case by the Department. Lectures, M W F 10. Messrs. KNUDSON and STEWARD.

232. *PLANT PHYSIOLOGY, ADVANCED LABORATORY COURSE.* Throughout the year. Credit three hours a term. Prerequisite or parallel, Botany 231. Laboratory, M 2-4:30 and S 8-12:30. Mr. CLARK.

234. *PLANT PHYSIOLOGY, ADVANCED LECTURE COURSE.* Fall term. Credit one hour. Prerequisite, Botany 231 or adequate preparation in botany and chemistry. Mr. SNYDER. T 4:15-5.

This course deals primarily with physiology in relation to hormones, photoperiodism, and vernalization.

## CHEMISTRY

Mr. FRANKLIN A. LONG, *Chairman*; Messrs. SIMON H. BAUER, ALFRED T. BLOMQUIST, THOMAS R. BRIGGS, PETER P. DEBYE, DELOS F. DETAR, P. J. FLORY, JAMES L. HOARD, JOHN R. JOHNSON, ALBERT W. LAUBENGAYER, WILLIAM T. MILLER, EARLE E. MUSCHLITZ, MELVIN L. NICHOLS, R. KEITH OSTERHELD, JACOB PAPISH, HARVEY W. POSVIC, RICHARD A. REINHARDT, HAROLD A. SCHERAGA, MICHELL J. SIENKO, ERVIN R. VAN ARTSDALEN.

*All courses listed below, except Chemistry 220 and 307 (fall term) and 308 (spring term), will be given in the Baker Laboratory of Chemistry.*

*For a major in Chemistry the following courses must be completed: (1) in Chemistry, Courses 105-106, and 201; or, preferably, 111-112, 115, and 212; 215, or 220 and 222; 307-308, 311; 407-408, 411; and six hours of electives; (2) in related subjects, Mathematics 161-162-163; or 171-172-173; Physics 103 and 104; or 107 and 108; German 101, unless two units have been offered for entrance.*

## INORGANIC CHEMISTRY

*Students exceptionally well prepared in chemistry should read the section on p. 13 in regard to college credit examinations.*

\*101-102. *GENERAL CHEMISTRY.* Throughout the year. Credit three hours a term. Chemistry 101 is prerequisite to Chemistry 102. A terminal course for those students who do not intend to take more chemistry. Will not serve as prerequisite for more advanced courses in chemistry. Open to those who have had or have not had secondary school chemistry. Lectures, M W 10 or 11. Laboratory, M T W Th or F 8-10:30, 10:30-1, or 2-4:30, or S 8-10:30. Conference, one hour a week, to be arranged. Mr. SIENKO and assistants.

Emphasis on the more important chemical principles and facts, on the scientific method, and on the relation of chemistry to the other fields of knowledge and to everyday life.

\*105-106. *GENERAL CHEMISTRY.* Throughout the year. Credit three hours a term. Chemistry 105 is prerequisite to Chemistry 106. For those students who will take more chemistry, it serves as a prerequisite to the more advanced courses. Open to those who have had or have not had secondary school chemistry. May be elected by students who do not intend to take more chemistry. Lectures, T Th 9, 10, or 12.

Laboratory, M T W Th or F 8-10:30, 10:30-1, or 2-4:30, or S 8-10:30. Conference, one hour a week, to be arranged. Mr. VAN ARTSDALEN, Mr. REINHARDT, and assistants.

The important chemical principles and facts will be covered, with considerable attention given to the quantitative aspects and to the technics which are important for further work in chemistry.

\*111-112. *INTRODUCTORY INORGANIC CHEMISTRY*. Throughout the year. Credit, Chemistry 111, three hours, Chemistry 112, two hours. Chemistry 111 is prerequisite to Chemistry 112. Chemistry 115 must be taken with Chemistry 111, except by consent of the instructor. Open to those students who have offered high school chemistry for entrance. Required of candidates for the degree of B. Chem. Eng. and recommended for candidates for the degree of A.B. with a major in chemistry. Lectures, fall term, M W F 8; spring term, W F 8. Mr. LAUBENGAYER and Mr. SIENKO.

\*115. *INTRODUCTORY INORGANIC LABORATORY*. Fall term. Credit three hours. Must be taken with Chemistry 111. Laboratory, T Th 8-10:30, W F 10:30-1, or W 2-4:30 and S 10-12:30. Conference, one hour a week to be arranged. Mr. LAUBENGAYER, Mr. SIENKO, and assistants.

575-576. *ADVANCED INORGANIC CHEMISTRY*. Throughout the year. Credit three hours a term. Prerequisite or parallel courses, Chemistry 403-404, or 407-408, or consent of the instructor. Chemistry 575 is prerequisite to Chemistry 576. Open to upperclassmen and graduate students. Lectures, M W F 11. Mr. LAUBENGAYER.

Theories of atomic structure and chemical bonding are applied systematically to the elements as they appear in the Periodic System, with emphasis on the stereochemistry of inorganic substances.

580. *ADVANCED INORGANIC LABORATORY*. Either term. Credit two to six hours. Prerequisite, Chemistry 307-308 and 311 and 312, and consent of the instructor. Chemistry 580 is designed to accompany Chemistry 575-576 but may be taken separately. Hours to be arranged. Messrs. LAUBENGAYER, OSTERHELD, SIENKO, and VAN ARTSDALEN.

Laboratory practice. The preparation, purification, properties, and reactions of inorganic compounds, including those of the rarer elements.

585-586. *SELECTED TOPICS IN ADVANCED INORGANIC CHEMISTRY*. Throughout the year. Credit two hours a term. Students may register for either term separately. Prerequisite, Chemistry 403-404, or 407-408 and consent of the instructor. Instructors and topics to be announced. Lectures, T Th 11.

Detailed consideration is given each term to one or two special topics selected from the field of theoretical and experimental inorganic chemistry. Topics are varied from year to year.

### ANALYTICAL CHEMISTRY

\*201. *INTRODUCTORY QUALITATIVE ANALYSIS*. Short course. Either term. Credit four hours. Prerequisite, Chemistry 105-106, or 111 and 115. Enrollment may be limited, especially in the spring term. Lectures, M W 12. Laboratory, T Th 1:40-4:30 (either term) or T Th 8-11 (fall term only). Mr. BAUER and assistants.

A study of the properties and reactions of the common elements and acid radicals and their detection in various solutions and solids.

\*212. *INTRODUCTORY QUALITATIVE ANALYSIS*. Spring term. Credit five hours. Prerequisite, Chemistry 111 and 115. Must be taken with Chemistry 112. Required of candidates for the degree of B. Chem. Eng. and recommended for candidates for the degree of A.B. with a major in Chemistry. Lectures, M S 8. Recitation, one hour a week, to be arranged. Laboratory, T Th 8-11 or W F 10-1. Mr. BAUER and assistants.

A study of the application of the theories of general chemistry, and the properties and reactions of the common elements and acid radicals to their systematic separation and detection, and their detection in various solutions and solids.

215. *INTRODUCTORY QUANTITATIVE ANALYSIS*. Short course. Either term. Credit four hours. Prerequisite, Chemistry 201 or 212. Lectures, M W 12. Laboratory, M W or T Th 2-4:30 (either term) or T Th 8-10:30 (spring term only). Mr. SCHERAGA and assistants.

A study of the fundamental principles of gravimetric and volumetric analysis, and the analysis of various substances by these methods.

220. *INTRODUCTORY QUANTITATIVE ANALYSIS*. Either term. Credit three hours. Prerequisite, Chemistry 201 or 212. Chemistry 222 must be taken with Chemistry 220. Required of candidates for the degree of B. Chem. Eng. and recommended for candidates for the degree of A.B. with a major in chemistry. Lectures, M W 10. Recitation, one hour a week, to be arranged. Mr. NICHOLS, Mr. SCHERAGA, and assistants.

A study of the fundamental principles of gravimetric and volumetric analysis with practice in stoichiometry.

222. *INTRODUCTORY QUANTITATIVE LABORATORY*. Either term. Credit three hours. Prerequisite, Chemistry 201 or 212. Must be taken with Chemistry 220. Required of candidates for the degree of B. Chem. Eng. and recommended for candidates for the degree of A.B. with a major in Chemistry. Laboratory, F 1-4:30 and S 9-12:30 (either term) or T Th 9-12:30 (fall term only). Mr. NICHOLS, Mr. SCHERAGA, and assistants.

Laboratory practice in the preparation and standardization of various volumetric solutions and the analysis of a variety of substances by volumetric and gravimetric methods.

240. *SPECIAL METHODS OF QUANTITATIVE ANALYSIS*. Either term. Credit three hours. Prerequisite, Chemistry 220 and 222, or consent of the instructor. Primarily for candidates for the degree of B. Chem. Eng. Lecture, T 11. Laboratory, M T or Th F 2-4:30. Mr. NICHOLS and assistants.

The analysis of gaseous and solid fuels, and gas evolution methods. The application of instrumental methods to quantitative analysis including nephelometric, refractometric, colorimetric, electrolytic, combustion, conductometric, and potentiometric methods.

265. *ADVANCED QUANTITATIVE LABORATORY*. Spring term. Credit two to four hours. Prerequisite, Chemistry 240, or consent of the instructor. Laboratory, hours to be arranged. Mr. NICHOLS and Mr. SCHERAGA.

Laboratory practice in the application of special methods of quantitative analysis and the analysis of special materials.

[275. *QUANTITATIVE MICROANALYSIS*. Fall term. Credit three or more hours. Prerequisite, consent of the instructor. Primarily for graduate students. Enrollment is limited. Laboratory, W F 9-5. Mr. NICHOLS and assistant.

Laboratory practice in typical methods of both organic and inorganic quantitative microanalysis. Not offered in 1951-52.]

[280. *EMISSION SPECTROSCOPY IN CHEMICAL ANALYSIS*. Either term. Credit three hours. Prerequisite, consent of the instructor. Primarily for seniors and graduate students. Conference, one hour a week, to be arranged. Laboratory, hours to be arranged. Mr. PAPISH and assistant. Not offered in 1951-52.]

[285. *SPECTROCHEMICAL ANALYSIS*. Either term. Credit two or more hours. Prerequisite, Chemistry 280. Laboratory, hours to be arranged. Mr. PAPISH and assistant. Not offered in 1951-52.]

[290. *ADVANCED QUANTITATIVE ANALYSIS*. Spring term. Credit two hours. Prerequisite, Chemistry 403 or 407. Primarily for graduate students. Lectures, W F 9. Mr. NICHOLS.

A discussion of selected topics in quantitative analysis, and the development and present status of various analytical methods. Given in alternate years. Not offered in 1951-52.]

## ORGANIC CHEMISTRY

301. *INTRODUCTION TO ORGANIC CHEMISTRY*. Either term. Credit two hours. Prerequisite, Chemistry 105-106. For students in engineering. Lectures, W F 9. Mr. BLOMQUIST.

A brief survey of the principal classes of organic compounds, their industrial sources, manufacture, and utilization.

303. *ELEMENTARY ORGANIC CHEMISTRY*. Either term. Credit four hours. Prerequisite, Chemistry 105-106. Chemistry 201 is desirable but not required. Chemistry 305 must be taken with Chemistry 303. Primarily for students in the premedical and biological curricula. Lectures, M W F S 11. Mr. POSVIC.

A study of aliphatic and aromatic organic compounds, their occurrence, relations, and uses.

The student should determine the entrance requirement in organic chemistry for the particular medical school he wishes to enter. Students may obtain six hours' credit by taking Chemistry 303 and 305. An additional two hours' credit in laboratory may be obtained by taking Chemistry 306. For those students desiring a longer course, Chemistry 307-308 (six hours) and Chemistry 311 (three hours) are recommended.

305. *ELEMENTARY ORGANIC LABORATORY*. Either term. Credit two hours. Must be taken with Chemistry 303. Laboratory, M W or T Th 2-4:30. Mr. POSVIC and assistants.

Laboratory experiments on the preparation and reactions of typical aliphatic and aromatic organic compounds.

306. *ORGANIC LABORATORY*. Spring term. Credit two hours. Prerequisite, Chemistry 303 and 305. Laboratory, M W 2-4:30. Mr. POSVIC and assistants.

A continuation of Chemistry 305.



307-308. *INTRODUCTORY ORGANIC CHEMISTRY*. Throughout the year. Credit three hours a term. Prerequisite, Chemistry 201 or 212. Chemistry 215 or 220 and 222 is desirable but not required. Chemistry 307 is prerequisite to Chemistry 308. Chemistry 311 must be taken with Chemistry 307. Required of candidates for the degrees of B. Chem. Eng. and A.B. with a major in Chemistry, and recommended for premedical students who desire the longer course. Lectures, M W F 9. Mr. JOHNSON.

A study of the more important compounds of carbon, their occurrence, methods of preparation, relations, and uses.

311. *INTRODUCTORY ORGANIC LABORATORY*. Fall term. Credit three hours. Must be taken with Chemistry 307. Required of candidates for the degrees of B. Chem. Eng. and A.B. with a major in chemistry and recommended for premedical students who desire the longer course. (See Chemistry 303 and 305.) Laboratory, T Th 9-12:30, T Th 1-4:30, or F 1-4:30 and S 9-12:30. Mr. DeTAR and assistants.

The student prepares typical compounds of carbon and familiarizes himself with their properties, reactions, and relations.

312. *INTERMEDIATE ORGANIC LABORATORY*. Spring term. Credit three hours. Prerequisite, Chemistry 311, parallel course Chemistry 308. Required of candidates for the degree of B. Chem. Eng. and recommended for candidates for the degree of A.B. with a major in Chemistry and for premedical students who desire the longer course. (See Chemistry 303 and 305.) Laboratory, T Th 9-12:30, T Th 1-4:30, or F 1-4:30 and S 9-12:30. Mr. DeTAR, Mr. MILLER, and assistants.

A continuation of Chemistry 311.

320. *IDENTIFICATION OF ORGANIC COMPOUNDS*. Either term. Credit four hours. Prerequisite, Chemistry 307-308 and 311-312, at grades of 75 or better. Primarily for students who plan to take advanced work in organic chemistry or in related fields. Lectures, T Th 8. Laboratory, T Th 2-4:30, or F 2-4:30, and S 10-12:30. Mr. MILLER and assistants.

The classification reactions of organic compounds and the preparation of solid derivatives are applied to the identification of unknown organic substances.

330. *ADVANCED ORGANIC LABORATORY*. Either term. Credit two to four hours. Prerequisites, Chemistry 312 and 320 and consent of the instructor. Primarily for seniors and graduate students as preparation for advanced and independent work. Enrollment limited for undergraduates to those having a record of 80 or better in prerequisite courses. Laboratory, hours to be arranged. Messrs. BLOMQUIST, DeTAR, JOHNSON, MILLER, and POSVIC.

An advanced course in organic synthetic procedures, involving preparation of intermediates for organic research and use of standard reference works.

365-366. *ADVANCED ORGANIC CHEMISTRY*. Throughout the year. Credit three hours a term. Prerequisite, Chemistry 307-308, 311-312 and 320, or consent of the instructor. Primarily for seniors and graduate students intending to do advanced work in organic chemistry or related fields. Enrollment limited for undergraduates to those having a record of 80 or better in prerequisite courses. Students may register for either term separately. Lectures, M W F 12. Messrs. BLOMQUIST, DeTAR, and JOHNSON.

Fall term: survey of the more important classes of organic compounds and their

reactions. Spring term: discussion of general topics (tautomerism, molecular rearrangements, stereochemistry).

375-376. *SELECTED TOPICS IN ORGANIC CHEMISTRY*. Throughout the year. Credit two hours a term. Prerequisite, Chemistry 365-366. Primarily for graduate students. Open to undergraduates only with the consent of the instructor. Students may register for either term separately. Lectures, T Th 9. Mr. BLOMQUIST.

Fall term: organic compounds of nitrogen and sulfur. Spring term: the simpler heterocycles and alicyclic compounds. Given in alternate years.

[380. *ORGANIC CHEMISTRY OF HIGH POLYMERS*. Fall term. Credit two hours. Prerequisite, Chemistry 365-366 or consent of the instructor. Primarily for graduate students. Lectures, M W 11. Mr. MILLER.

The mechanism of polymerization processes and the chemical structure and properties of high polymers will be discussed, with examples chosen from the more significant natural and synthetic high molecular weight materials. Given in alternate years. Not offered in 1951-52.]

385. *PHYSICAL ASPECTS OF ORGANIC CHEMISTRY*. Fall term. Credit two hours. Prerequisite, Chemistry 320 or 365-366, and consent of the instructor. Primarily for graduate students. Lectures, M W 11. Mr. MILLER.

A discussion of recent theoretical developments in organic chemistry and their application to typical reactions. Given in alternate years.

[395-396. *CHEMISTRY OF NATURAL PRODUCTS*. Throughout the year. Credit two hours a term. Prerequisite, Chemistry 320 or 365-366. Primarily for graduate students. Open to undergraduates by consent of the instructor. Students may register for either term separately. Lectures, T Th 9. Mr. POSVIC.

A discussion of the organic chemistry of natural products. Fall term: terpenes, vitamin A, quinones, plant pigments, antibiotics, and alkaloids. Spring term: amino acids, proteins, carbohydrates, vitamin C, the vitamin B group, and steroids. Given in alternate years. Not offered in 1951-52.]

## PHYSICAL CHEMISTRY

402. *INTRODUCTION TO PHYSICAL CHEMISTRY*. Either term. Credit two hours. Prerequisite, Chemistry 105-106. Prerequisite or parallel courses: Mathematics 163 or 173 and Physics 117. For students in engineering. Lectures, W F 12. Mr. MUSCHLITZ.

A brief survey of Physical Chemistry with emphasis on topics of interest to students in engineering.

403-404. *INTRODUCTORY PHYSICAL CHEMISTRY*. Throughout the year. Credit three hours a term. Prerequisite, Chemistry 215 or 220 and 222, 307-308, Mathematics 161-162-163, and Physics 107 and 108 (or their substantial equivalent). Chemistry 403 is prerequisite to Chemistry 404. Required of candidates for the degree of B. Chem. Eng. Lectures, M W F 9. Mr. BRIGGS.

A systematic presentation of the principles of physical chemistry. The topics include the properties of gases, liquids, and solids; physical and chemical equilibrium in homogeneous and heterogeneous systems; the mass law, theorem of Le Chatelier, and the phase rule; thermochemistry and elementary thermodynamics; the theory of solutions; ionic equilibria; chemical kinetics; problems in physical chemistry.

[405-406. *ELEMENTARY PHYSICAL CHEMISTRY*. Throughout the year. Credit: Chemistry 405, three hours; Chemistry 406, two hours. Prerequisite, Chemistry 303 and 305 and Mathematics 153-154. Chemistry 405 is prerequisite to Chemistry 406. Open only to students in the biological sciences. Lectures, fall term, T Th S 12; spring term, T Th 12. Mr. HOARD.

A survey of the principles of elementary physical chemistry, including an introduction to colloid chemistry and electrochemistry. Not offered in 1951-52.]

407-408. *INTRODUCTORY PHYSICAL CHEMISTRY*. Throughout the year. Credit three hours a term. Prerequisite, Chemistry 215 or 220 and 222, 307-308, which may be taken concurrently; Mathematics 171-172-173, or their equivalent; Physics 103 and 104, or 107 and 108. Chemistry 407 is prerequisite to Chemistry 408. Required of candidates for the degree of A.B. with a major in chemistry, and open to other qualified students by consent of the instructor. Lectures, M W F 10. Mr. HOARD.

A study of the more fundamental principles of physical chemistry from the standpoint of the laws of thermodynamics, and of the kinetic theory. A unified treatment of the properties of matter, thermochemistry, and properties of solutions, and of equilibrium in homogeneous and heterogeneous systems. Chemical kinetics and catalysis are included.

411-412. *INTRODUCTORY PHYSICAL LABORATORY*. Throughout the year. Credit three hours a term. Prerequisite or parallel course, Chemistry 403-404, or 407-408. Students may register for either term separately. Enrollment may be limited. Laboratory, M T or Th F 2-4:30. Mr. BRIGGS, Mr. HOARD, Mr. MUSCHLITZ, and assistants.

Qualitative and quantitative experiments illustrating the principles of physical chemistry, and practice in performing typical physicochemical measurements.

[431-432. *APPLIED ELECTROCHEMISTRY*. Throughout the year. Credit two hours a term. Prerequisite, Chemistry 403-404, or 407-408. Chemistry 431 is prerequisite to Chemistry 432, T Th 9. Mr. BRIGGS.

Elementary theory of electrolysis and electromotive force. Electrolytic refining and extraction of metals; electroplating; electrolytic preparation of organic and inorganic compounds; electrothermal electrolysis; storage cells.

By electing Chemistry 465 (two or more hours), the student may obtain laboratory practice in many of the subjects which are presented in the lectures. Given in alternate years. Not offered in 1951-52.]

440. *COLLOID CHEMISTRY*. Spring term. Credit three hours. Prerequisite, Chemistry 403-404, or 407-408. Lectures, M W F 11. Mr. BRIGGS.

The general theory of colloid chemistry and adsorption. Applications of the theory, with emphasis on the inorganic colloids. Given in alternate years.

445. *APPLICATION OF THE PHASE RULE*. Fall term. Credit three hours. Prerequisite, Chemistry 403-404, or 407-408. Lectures, M W F 11. Mr. BRIGGS.

A study of phase equilibria in two-component, three-component, and four-component systems. Interpretation of phase diagrams, equilibria in saturated salt solutions, indirect analysis, and paths of crystallization.

450. *SOLID STATE*. Fall term. Credit three hours. Prerequisite, Chemistry 403-404 or 407-408. Lectures, T Th S 10. Mr. HOARD.

Discussion of structural types established for crystals through X-ray analysis, ionic and atomic radii, coordination number, packing relations, and stereochemistry of molecules and complex ions. Correlation of structure with physical properties, especially for ionic and metallic crystals. Given in alternate years.

455. *KINETICS OF CHEMICAL REACTIONS*. Spring term. Credit three hours. Prerequisite, Chemistry 403-404 or 407-408. Primarily for graduate students. Open to undergraduates by consent of the instructor. Lectures, M W F 11. Mr. LONG.

A general discussion of rates of reaction including types of reactions, methods of measurement, theories of reaction rates, application to problems.

460. *CHEMICAL PHYSICS*. Spring term. Credit two hours. Primarily for seniors and graduate students majoring in chemistry and physics. Lectures, S 11-1. Mr. DEBYE.

An elementary presentation of the principles involved in describing the structure and behavior of matter; atomic structure and the periodic table; interatomic forces; structure of solids; electrons in metals; temperature equilibrium, and statistics.

[461. *RADIOCHEMISTRY*. Fall term. Credit three hours. Prerequisite, Chemistry 403-404, or 407-408. Primarily for graduate students. Lectures, M W F 12. Mr. MILLER.

A discussion of properties of the nucleus; spontaneous and induced nuclear reactions; radioactivity measurement; applications of radioisotopes; chemical techniques in the investigation of nuclear phenomena; and chemistry of radioactive elements. Given in alternate years. Not offered in 1951-52.]

465. *ADVANCED LABORATORY PRACTICE IN PHYSICAL CHEMISTRY*. Either term. Credit two to six hours. Prerequisite, consent of the instructor. Hour and place to be arranged. Messrs. BAUER, BRIGGS, FLORY, HOARD, LONG, and MUSCHLITZ.

471-472. *THERMODYNAMICS*. Throughout the year. Credit three hours a term. Prerequisite, Chemistry 403-404, or 407-408. Chemistry 471 is prerequisite to Chemistry 472. Primarily for graduate students. Lectures, M W F 9. Mr. FLORY.

Development of the general equations of thermodynamics from the first and second laws. Applications to the study of physicochemical equilibria in gases, liquids, solids, and liquid solutions. Problems.

480. *STATISTICAL MECHANICS*. Fall term. Credit three hours. Prerequisite, Chemistry 491 or equivalent is desirable but not required. Primarily for graduate students. Lectures, T Th S 10. Mr. FLORY.

An introduction to quantum statistical mechanics with applications to chemistry. Given in alternate years.

[485. *X-RAY CRYSTALLOGRAPHY*. Spring term. Credit three hours. Prerequisite, Physics 225 or consent of the instructor. Mr. HOARD.

Space groups, reciprocal lattices, three dimensional diffraction, interpretation of X-ray diffraction data, structure determination by Fourier synthesis. Given in alternate years. Not offered in 1951-52.]

[482. *PHYSICAL CHEMISTRY OF HIGH POLYMERS*. Spring term. Credit two hours. Prerequisite, Chemistry 380, 471-472, or consent of the instructor. Primarily for graduate students. Lectures, M W 11. Mr. FLORY.

The physical chemistry of high polymers and their solutions in the light of modern theories, and the principles underlying quantitative interpretation of molecular weight structure, and configurations of polymeric substances. Given in alternate years. Not offered in 1951-52.]

[491. *INTRODUCTION TO QUANTUM MECHANICS*. Fall term. Credit two hours. Prerequisite, consent of the instructor. Primarily for graduate students. Lectures, S 11-1. Mr. DEBYE.

Elementary presentation of the fundamentals of quantum mechanics. Given in alternate years. Not offered in 1951-52.]

[492. *QUANTUM CHEMISTRY*. Spring term. Credit three hours. Prerequisite, Chemistry 491 or its equivalent. Primarily for graduate students. Lectures, M W F 9. Mr. BAUER. Given in alternate years. Not offered in 1951-52.]

495. *MOLECULAR SPECTRA*. Fall term. Credit three hours. Prerequisite, consent of the instructor. Primarily for graduate students majoring in physical chemistry and physics. Lectures, hours to be arranged. Mr. BAUER.

Description of various types of molecular spectra. The rotational and vibrational spectra of polyatomic molecules (energy levels, normal coordinate treatment, selection rules). Relations between molecular structure and molecular constants. Given in alternate years.

## THE CLASSICS

Mr. JAMES HUTTON, *Chairman*; Messrs. EDWARD L. BASSETT, HARRY CAPLAN, GORDON M. KIRKWOOD, FRIEDRICH SOLMSEN, FREDERICK O. WAAGE.

*Those whose major study is in the Classics must complete twenty hours of advanced courses in the Department (Greek courses numbered above 201 or Latin courses numbered above 206), and fifteen hours, selected after conference with the adviser, in related subjects. Related subjects for this purpose are Ancient History, Modern Foreign Languages and Literatures, particularly French and German, Ancient Philosophy, Fine Arts 301, 312, 315, Courses 201-202, 207, 214, and 401 in the Division of Literature, and Linguistics 201-202 and 281-282.*

*Those whose major study is in Classical Civilization must complete (a) eighteen hours in Latin or Greek; (b) Courses 201-202, and 207 in the Division of Literature, and nine further hours selected from the courses listed below under Classical Civilization; and (c) fifteen hours in related subjects. Related subjects for this purpose may be any courses in the Humanities, but selected in conference with the adviser so as to form a coherent and significant experience in the relation between antiquity and subsequent periods in the Western tradition; they may include courses listed under Classical Civilization which have not been used to satisfy requirement (b).*

*Students wishing to qualify for the degree of Bachelor of Arts with Honors in Classics should consult some member of the Department before preregistering for the junior year.*

*Students whose major study is in the Classics with an emphasis on Latin must include in their program before graduation Latin 205-206, 315-316, and 317-318.*

## GREEK

\*101 *GREEK FOR BEGINNERS*. Either term. Credit three hours. M W F 12. Fall term, Mr. HUTTON; spring term, Mr. CAPLAN.

Introduction to Homer's *Iliad*.



\*103. *HOMER'S ILIAD*. Either term. Credit three hours. Prerequisite, Greek 101. M W F 12. Fall term, Mr. SOLMSEN; spring term, Mr. KIRKWOOD.  
Continuation of Greek 101.

\*201. *ATTIC GREEK*. Either term. Credit three hours. Prerequisite, Greek 103. M W F 9. Fall term, Mr. CAPLAN; spring term, Mr. SOLMSEN.  
Xenophon, *Anabasis*; Plato, *Selected Dialogues*.

\*203. *EURIPIDES, IPHIGENIA IN TAURIS, AND ALCESTIS; NEW TESTAMENT, SELECTIONS*. Either term. Credit three hours. Prerequisite, Greek 201. T Th S 10. Fall term, Mr. KIRKWOOD; spring term, Mr. BASSETT.

209-210. *GREEK COMPOSITION*. Throughout the year. Credit one hour a term. Prerequisite, Greek 103 or the equivalent. T 2. Mr. KIRKWOOD.

301-302. *ARISTOPHANES, CLOUDS; SOPHOCLES, OEPIDUS REX; HERODOTUS*. Throughout the year. Credit three hours a term. Prerequisite, Greek 203. T Th S 10. Mr. SOLMSEN.

305-306. *LYRIC POETRY; AESCHYLUS, PROMETHEUS BOUND; THEOCRITUS; DEMOSTHENES, PHILIPPIC ORATIONS*. Throughout the year. Credit three hours a term. Prerequisite, Greek 301-302. T Th S 10. Mr. —.

309-310. *ADVANCED GREEK COMPOSITION*. Throughout the year. Credit one hour a term. Prerequisite, Greek 209-210 or the equivalent. W 2. Mr. SOLMSEN.

[389. *GREEK DIALECTS*. Credit two hours. For graduate students. Not offered in 1951-52.]

395. *SEMINAR: SOPHOCLES*. Throughout the year. Credit three hours a term. For graduate students. Library, Classical Seminar Room. M 2-4. Mr. KIRKWOOD.

050. *INFORMAL STUDY*. For qualified majors.

## LATIN

\*105-106. *LATIN FOR BEGINNERS*. Throughout the year. Credit three hours a term. M W F 12. Mr. —.

\*107. *FRESHMAN COURSE: SELECTIONS FROM CICERO AND VIRGIL*. Fall term. Credit three hours. Prerequisite, Latin 106 or two units of entrance Latin. M W F 11. Mr. BASSETT. For the second term of Latin 107, see Latin 110.

Designed to meet the needs of students who have had two years of Latin in school. For the sake of those whose study of Latin has been interrupted, a considerable amount of review will be included in the course.

\*109. *FRESHMAN COURSE: VIRGIL AND OVID*. Fall term. Credit three hours. For students offering three units of entrance Latin. M W F 11. Mr. HUTTON.

\*110. *FRESHMAN COURSE: HORACE, ODES AND EPODES*. Spring term. Credit three hours. Prerequisite, Latin 107 or 109. M W F 11. Mr. BASSETT.

\*111-112. *FRESHMAN COURSE*. Throughout the year. Credit three hours a term. For students offering four units of entrance Latin. M W F 11. Mr. CAPLAN.

Cicero, *De Senectute*; Martial, *Epigrams*; Horace, *Odes and Epodes*.

205-206. *TERENCE, ANDRIA; CATULLUS; HORACE, SATIRES AND EPISTLES*;

*VIRGIL, GEORGICS; LIVY.* Throughout the year. Credit three hours a term. Prerequisite, Latin 109-110 or 111-112. M W F 11. Mr. BASSETT.

[215. *REMAINS OF EARLY LATIN.* Fall term. Credit two hours. Prerequisite or parallel course, Latin 205-206 or 317-318. Not offered in 1951-52.]

[216. *VIRGIL, AENEID, BOOKS VII-XII.* Spring term. Credit two hours. Prerequisite or parallel course, Latin 205-206 or 317-318. Not offered in 1951-52.]

221-222. *LATIN COMPOSITION.* Throughout the year. Credit one hour a term. Prerequisite, Latin 109-110 or 111-112. M 2. Mr. BASSETT.

[315-316. *THE GREATER REPUBLICAN WRITERS: PLAUTUS, CICERO, LUCRETIUS.* Throughout the year. Credit three hours a term. Prerequisite, Latin 205-206. Not offered in 1951-52.]

317-318. *LITERATURE OF THE EARLY EMPIRE: TACITUS, ANNALS; JUVENAL; PLINY'S LETTERS; SENECA'S LETTERS.* Throughout the year. Credit three hours a term. Prerequisite, Latin 205-206. T Th S 9. Fall term, Mr. HUTTON; spring term, Mr. SOLMSEN.

321-322. *LATIN COMPOSITION. ADVANCED COURSE.* Throughout the year. Credit one hour a term. For undergraduates who have completed Latin 221-222 and for graduate students. Th 2. Mr. SOLMSEN.

[347. *HISTORY OF THE LATIN LANGUAGE.* Credit two hours. For upperclassmen and graduate students. Not offered in 1951-52.]

348. *VULGAR LATIN: PETRONIUS, CENA TRIMALCHIONIS; VULGAR LATIN INSCRIPTIONS.* Fall term. Credit two hours. T Th 12. Mr. BASSETT.

[350. *COMPARATIVE GRAMMAR OF GREEK AND LATIN.* Credit two hours. For upperclassmen and graduate students. Not offered in 1951-52.]

[369. *MEDIEVAL LATIN LITERATURE.* Spring term. Credit three hours. Prerequisite, three years of High School Latin or the equivalent. Not offered in 1951-52.]

[381-382. *SEMINAR.* Throughout the year. Credit three hours a term. For graduate students. Not offered in 1951-52.]

[390. *ITALIC DIALECTS.* Spring term. Credit two hours. For graduate students. Not offered in 1951-52.]

060. *INFORMAL STUDY.* For qualified majors.

### CLASSICAL CIVILIZATION

[408. *CLASSICAL RHETORIC AND ORATORY.* Spring term. Credit three hours. Not offered in 1951-52.]

410. *LATIN AND GREEK ELEMENTS OF THE ENGLISH LANGUAGE.* Spring term. Credit two hours. T Th 11. Mr. BASSETT.

A historical and practical study of the Latin and Greek words and formations in English. Attention will be given to medical and other scientific terms as well as to the general vocabulary. No knowledge of Greek or Latin is required.

412. *CLASSIC MYTHS.* Spring term. Credit two hours. T Th 12. Mr. KIRKWOOD.

A study of the principal cycles of Greek mythology—for example, the myths of

the Gods, the Trojan Cycle, the Argive and Theban Cycles—and of their representation in art and literature. Anthropological aspects of the myths and their background in prehistory will be considered. Lectures and readings. Lectures will be illustrated from the collection of lantern slides in the possession of the Department of Classics.

*ENGLISH TRANSLATIONS OF GREEK AND LATIN CLASSICS.* (See Literature 201–202.)

*FOUNDATIONS OF WESTERN THOUGHT.* (See Literature 207.)

[*HUMANISM AND THE RENAISSANCE.* (See Literature 214.) Not offered in 1951–52.]

*PRINCIPLES OF LITERARY CRITICISM.* (See Literature 401–402.)

*OUTLINES OF ANCIENT HISTORY.* (See History 101, 102.)

*GREEK HISTORY.* (See History 211.)

[*THE HELLENISTIC AGE.* (See History 212.) Not offered in 1951–52.]

[*THE ROMAN REPUBLIC.* (See History 213.) Not offered in 1951–52.]

*THE ROMAN EMPIRE.* (See History 214.)

*INTRODUCTION TO ART.* (See Fine Arts 101–102.)

[*GREEK SCULPTURE.* (See Fine Arts 301.) Not offered in 1951–52.]

*ART OF THE ROMAN EMPIRE.* (See Fine Arts 302.)

[*NUMISMATICS: ANCIENT COINAGE.* (See Fine Arts 315.) Not offered in 1951–52.]

*HISTORY OF PHILOSOPHY.* (See Philosophy 301.)

*HISTORY OF POLITICAL THEORY.* (See Philosophy 325.)

*PLATO AND ARISTOTLE.* (See Philosophy 575–576.)

## ECONOMICS

Mr. G. P. ADAMS, JR., *Chairman*; Messrs. M. G. CLARK, M. A. COPELAND, DONALD ENGLISH, J. G. B. HUTCHINS, A. E. KAHN, M. S. KENDRICK, R. E. MONTGOMERY, CHANDLER MORSE, J. E. MORTON, P. M. O'LEARY, H. L. REED, E. P. REUBENS, LOUIS SIEGELMAN.

*For a major in Economics the following courses must be completed: (1) Economics 101, or 105 and 106, or the equivalent; and twenty-four hours of advanced courses, including Economics 901; (2) in related subjects, fifteen hours in not more than three of the following departments: Far Eastern Studies 201–202, Geology 105 and 108, Government, History, Mathematics, Philosophy, Psychology, and Sociology. Approved advanced courses in the field of Statistics may also be counted in satisfaction of the requirement in related subjects.*

*No courses may be offered as a related subject which is counted in satisfaction of the distribution requirements.*

*Students who intend to register in Arts and Sciences and in the School of Business and Public Administration or in the Law School will be required to complete fifteen hours of advanced courses in Economics, including Economics 901, and six hours of related courses.*

*Students whose work in the College and particularly in the courses comprising their major has been of high quality may be permitted to enroll in informal study in Economics (090) in their senior year.*

*Candidates for Honors in Economics will be required to pass a special examination and should consult their advisers before the beginning of their senior year.*

[\*101. *MODERN ECONOMIC SOCIETY*. Either term. Credit five hours. Not open to first-term freshmen. Freshmen in their second term will be admitted by permission. M T W Th F 8, 10, 11, 12, or 1. Not offered in 1951-52.]

\*105. *MODERN ECONOMIC SOCIETY*. Fall term. Credit three hours. Open to a limited number of freshmen. M W F 8, 12, 1, 2, or 3; T Th S 8. Mr. MORSE and assistants.

A survey of the existing economic order, its more salient and basic characteristics, and its operations.

106. *MODERN ECONOMIC SOCIETY*. Spring term. Credit three hours. Prerequisite, Economics 105. M W F 8, 12, 1, 2, or 3; T Th S 8. Mr. MORSE and assistants.

107. *INTRODUCTION TO ECONOMICS*. Either term. For students in Engineering. Credit three hours. Hours to be arranged. Mr. MORSE and assistants.

An introduction to the more essential economic features of contemporary American Society.

## MONEY, BANKING, AND TRADE FLUCTUATIONS

203. *MONEY, CURRENCY, AND BANKING*. Fall term. Credit three hours. Prerequisite, Economics 101 or 106. M W F 11. Mr. REED.

A study of our currency system and banking processes for the primary purpose of training the student to determine the influence of monetary factors in economic problems.

204. *MONEY, CURRENCY, AND BANKING*. Spring term. Credit three hours. Prerequisite, Economics 201 or 203. M W F 11. Mr. REED.

A continuation of Economics 203.

210. *COMMERCIAL BANKING*. Spring term. Credit three hours. Prerequisite, Economics 204, which may be taken concurrently. T Th S 10. Mr. REED.

Selected case problems will be studied for the purpose of gaining an understanding of the principles of bank administration.

220. *TRADE FLUCTUATIONS*. Fall term. Credit three hours. T Th S 10. Mr. REED.

A study of the causes and effects of trade recessions and revivals, with an introduction to the methods of business forecasting. There will be intermittent discussions of current economic trends.

[224. *THE SYSTEM OF MONEY FLOWS IN THE UNITED STATES*. Spring term. Credit three hours. Prerequisite, Economics 902. T Th S 11. Mr. COPELAND. Not offered in 1951-52.]

231. *FINANCIAL HISTORY OF THE UNITED STATES*. Fall term. Credit three hours. Prerequisite, Economics 204. T Th S 10. Mr. O'LEARY.

A study of developing financial institutions, problems and legislation from 1775 to 1935. Monetary, banking, and public finance will be dealt with against the changing background of American economic organizations. Special attention will be given to the impact of the Great Depression and the New Deal upon American finances. Library readings and reports.

## ACCOUNTING AND STATISTICS

301. *ACCOUNTING*. Either term. Credit three hours. Prerequisite, Economics 101 or 106. Fall term, T Th S 9; spring term, T Th S 10. One practice period, T 2-4 or W 2-4. Mr. ENGLISH.

Theory of debit and credit; the journal and ledger; the development of books of original entry; preparation of income statements and balance sheets.

302. *ACCOUNTING*. Either term. Credit three hours. Prerequisite, Economics 301. Fall term, T Th S 10, spring term, T Th S 9. One practice period, Th or F 2-4. Mr. ENGLISH.

Capital stock accounts; bonds and their valuation; amortization, reserves and reserve funds, analysis of income statements and balance sheets.

*ADVANCED ACCOUNTING*. (Business and Public Administration 112) Fall term. Credit three hours. Prerequisite, Economics 302. Limited to seniors who have the consent of the instructor. T Th S 10. Mr. SHANNON.

Problems of income determination and allocation; the admission, valuation, and presentation of typical asset and equity elements in a balance sheet, and the related revenue and expense aspects; analysis and interpretation of financial statements according to varying philosophies; special topics—sinking funds, special reserves, and operating schedules.

*ADVANCED ACCOUNTING*. (Business and Public Administration 113) Spring term. Credit three hours. Limited to seniors who have the consent of the instructor. T Th S 10. Mr. SHANNON.

A continuation of Economics 305. Analysis of installment sales and long-term contracts; consignments; branch accounting; consolidated statements; foreign exchange; reorganization and liquidation problems; estate and trust accounting; insurance, source and application of funds statement and related analysis of financial statements.

*STATISTICS*. (Industrial and Labor Relations 210) Either term. Credit three hours. Two lectures and one two-hour laboratory. Hours to be arranged. Mr. McCARTHY.

An introduction to basic concepts and uses of descriptive statistics, and problems of drawing valid inferences from statistical data. Specific topics included are classification, averages, dispersion, correlation, probability, tests of significance, confidence intervals.

*ECONOMIC STATISTICS*. (Industrial and Labor Relations 211) Spring term. Credit three hours. Prerequisite, I. and L.R. 210 or equivalent. Two lectures and one two-hour laboratory. Hours to be arranged. Mr. MORTON.

Application of statistical techniques to economic data, with particular emphasis on the analysis of index numbers, time series, income distributions, etc.

*For additional courses in statistics, see page 124.*



## ORGANIZATION AND CONTROL OF INDUSTRY

311. *CORPORATION FINANCE*. Either term. Credit three hours. Prerequisite, Economics 301 or its equivalent. Fall term, T Th S 9; spring term, T Th S 9. Mr. SIEGELMAN.

A study of the financial practices of business corporations in the United States; types of corporate securities; sources of capital funds; determination and administration of corporate incomes; financial difficulties and corporate reorganizations; the relation of corporate practices to the functioning of the American economic system; and the regulatory activities of the Securities and Exchange Commission.

321. *PRIVATE ENTERPRISE AND PUBLIC POLICY*. Fall term. Credit three hours. Prerequisite, Economics 101 or 106. M W F 9. Mr. KAHN.

The role of competition, monopoly, and public policy in various politico-economic philosophies, and, specifically, in a private enterprise economy. A study and evaluation of the American system of business organization, its price and production policies, and public policies of implementation and regulation.

322. *PUBLIC REGULATION OF BUSINESS*. Spring term. Credit three hours. Prerequisite, Economics 321 or consent of the instructor. M W F 9. Mr. KAHN.

A continuation of Economics 321, with special reference to recent developments in public control, and continuing investigations of specific current problems of public policy.

*TRANSPORTATION*. (Business and Public Administration 180) Fall term. Credit three hours. Limited to seniors who have taken Economics 101 or the equivalent. M W F 10. Mr. HUTCHINS.

A study of American transportation from the point of view of carriers, shippers, and public authorities. The emphasis is on the economics and practices of rate making, especially of railroads. Lectures, cases and discussions.

*TRANSPORTATION*. (Business and Public Administration 181) Spring term. Credit three hours. Limited to seniors who have taken B. and P. A. 180. M W F 10. Mr. HUTCHINS.

A continuation of B. and P.A. 180. The subjects covered include operational, service, and financial problems of railroads; motor carrier transportation; ocean shipping; port operations; and some aspects of air transportation.

## LABOR ECONOMICS

401. *LABOR CONDITIONS AND PROBLEMS*. Fall term. Credit three hours. Prerequisite, Economics 101 or the equivalent. M W F 10. Mr. MONTGOMERY.

An introduction to the field of Labor Economics and a survey of the more basic labor problems growing out of modern economic arrangements.

402. *TRADE UNIONISM AND COLLECTIVE BARGAINING*. Spring term. Credit three hours. Prerequisite, Economics 401 or consent of the instructor. M W F 10. Mr. MONTGOMERY.

A study of the origins, philosophic basis, aims, and policies of trade unions, of the economic implications of trade unionism and modern economic life, and of collective bargaining in selected industries.

411. *LEGAL AND CONSTITUTIONAL ASPECTS OF LABOR PROBLEMS*. Fall

term. Credit two hours. Consult the instructor before registering. T 2-4. Mr. MONTGOMERY.

A study of the legal aspects of trade union objectives and methods and an examination of state-labor relationships. Among the topics treated: legal theories underlying labor law; statutory enactments affecting trade unions; injunctions, damage suits, criminal prosecutions, restrictions upon employers; conciliation, arbitration, mediation; and various types of labor legislation.

[412. *LEGAL AND CONSTITUTIONAL ASPECTS OF LABOR PROBLEMS*. Spring term. Credit two hours. Consult the instructor before registering. T 2-4. Mr. MONTGOMERY. Not offered in 1951-52.]

A continuation of Economics 410, with emphasis on social legislation and social insurance.

420. *SELECTED PROBLEMS IN LABOR ECONOMICS*. Spring term. Credit two hours. Consult instructor before registering. T 2-4. Mr. MONTGOMERY.

An undergraduate seminar in some of the problems of labor economics. Topics to be studied include: approaches to, and conceptions of, the field of labor problems; collective and individual wage determination, wage-hour and labor-market structure, trends in the economic theory of wages, standards of remuneration and methods of wage payment; contemporary collective bargaining problems; quantitative measurements of labor phenomena; legal philosophy and labor relations; labor policies of business managements; international aspects of labor problems.

### PUBLIC FINANCE

*TAXATION*. (Agricultural Economics 138) Fall term. Credit three hours. Open to upperclassmen who have taken Economics 101 or the equivalent. M W F 11. Mr. KENDRICK.

A study of the principles and practices of public finance, with emphasis on taxation. Among the topics examined are growth of public expenditures; the changing pattern of federal, state, and local taxation; the incidence of taxation; and fiscal policy.

502. *FEDERAL PUBLIC FINANCE*. Spring term. Credit three hours. Prerequisite, Taxation (Agricultural Economics 138). M W F 11. Mr. KENDRICK.

An examination of national problems of taxation, expenditures, public debt, and fiscal policy.

### ECONOMIC HISTORY

*ECONOMIC AND BUSINESS HISTORY, 1750-1860*. (Business and Public Administration 120) Fall term. Credit three hours. Limited to seniors who have taken Economics 101. T Th S 10. Mr. HUTCHINS.

A study of the evolution of economic structure, business organization and practice, and economic policy in Europe and America. Primary emphasis is on the period 1750-1860. Lectures, cases and discussions.

*ECONOMIC AND BUSINESS HISTORY SINCE 1860*. (Business and Public Administration 121) Spring term. Credit three hours. Limited to seniors who have taken Economics 101. T Th S 10. Mr. HUTCHINS.

A continuation of Business and Public Administration 120, covering the period since 1860, but that course is not a prerequisite.

## INTERNATIONAL ECONOMICS

701-702. *INTERNATIONAL ECONOMICS*. Throughout the year. Credit three hours each term. Prerequisite, Economics 101 or 106. T Th S 11. Mr. MORSE.

A study of the economic relations between countries, with emphasis on the problems of constructing a prosperous, progressive world economy. Among the problems discussed are the theory of international trade and problems of commercial policy; international finance, balances of payments, foreign exchanges, and monetary policies and problems, past, present, and future.

[801. *ECONOMICS OF THE FAR EAST*. Fall term. Credit three hours. Prerequisite, Economics 101 or the equivalent or consent of the instructor. T Th S 10. Mr. REUBENS. Not offered in 1951-52.]

[802. *ECONOMICS OF THE FAR EAST*. Spring term. Credit three hours. T Th S 10. Mr. REUBENS. Not offered in 1951-52.]

*ECONOMICS OF SOVIET RUSSIA*. (Industrial and Labor Relations 341). Fall term. Credit three hours. Prerequisite, Economics 101 or the equivalent or consent of the instructor. M W F 10. Mr. CLARK.

An analysis of the principles, structure, and performance of the economy of the Soviet Union, emphasizing the Five-Year Plans. Attention will be given to resources and their allocation, industrialization, agriculture, transportation, fiscal policy, labor, domestic and foreign trade, and problems of war and postwar reconstruction.

*ECONOMICS OF SOVIET RUSSIA*. (Industrial and Labor Relations 342). Spring term. Credit three hours. M W F 10. Mr. CLARK.

Continuation of Economics 803. Students who have not taken Economics 803 but have adequate preparation in Economics and/or the Russian area will be admitted.

## ECONOMIC THEORY

901. *INTERMEDIATE ECONOMIC THEORY*. Either term. Credit three hours. Not open to sophomores. Required in the junior or senior year of all students majoring in Economics. Prerequisite, Economics 101 or 106. M W F 2. Mr. ADAMS, T Th S 10. Mr. SIEGELMAN.

An analysis of the pricing processes in a free-enterprise economy under varying competitive conditions and their role in the allocation of resources and the functional distribution of the national income.

902. *NATIONAL INCOME AND WEALTH*. Fall term. Credit three hours. Prerequisite, Economics 301 or consent of the instructor. M W F 2. Mr. COPELAND.

A statistical approach to the structure of the American economy, through studies of the size, composition, and distribution of the national income, with applications to the problems of economic planning.

[903. *HISTORY OF ECONOMIC THOUGHT*. Fall term. Credit three hours. M W F 8. Mr. ADAMS. Not offered in 1951-52.]

[904. *HISTORY OF ECONOMIC THOUGHT*. Spring term. Credit three hours. M W F 8. Mr. ADAMS. Not offered in 1951-52.]

911. *ECONOMICS OF DISSENT*. Fall term. Credit two hours. Open to upperclassmen with consent of the instructor. Th 2-4. Mr. MONTGOMERY.

A study of the literature of social protest; of unorthodox or dissenting economic doctrines; and of the various types of economic organization that have been proposed or attempted, including the Utopias, Marxian Socialism, Collectivism, Anarchism, the Single Tax, Syndicalism, Guild Socialism, Fabian Socialism, and Communism.

912. *ECONOMICS OF DISSENT*. Spring term. Credit two hours. Open to upperclassmen with consent of the instructor. Th 2-4. Mr. MONTGOMERY.

A continuation of Economics 910, with emphasis upon the structural characteristics and the pricing and resource-allocation problems of different types of economic organization.

920. *FULL EMPLOYMENT AND FREE ENTERPRISE*. Spring term. Credit three hours. Open to seniors majoring in Economics, and to others with the consent of the instructor. T Th S 11. Mr. COPELAND.

A study of the relations of labor overdemand and of the forms of unemployment to optimum employment and to the system of capitalism and free private enterprise. A critical examination of recent federal policies to promote optimum employment and of various optimum employment plans.

#### GRADUATE SEMINARS

These are open to graduates and, with the consent of the instructor, to qualified seniors.

275. *MONETARY AND BUSINESS CYCLE THEORY*. Throughout the year. Credit three hours a term. Hours to be arranged. Mr. REED.

*BASIC ECONOMIC STATISTICS* (Industrial and Labor Relations 103). Fall term. Credit three hours. Hours to be arranged. Mr. —.

*SEMINAR IN ECONOMIC STATISTICS* (Industrial and Labor Relations 113). Spring term. Credit three hours. Hours to be arranged. Mr. —.

375. *PUBLIC CONTROL OF BUSINESS*. Throughout the year. Credit three hours a term. Hours to be arranged. Mr. KAHN.

475. *LABOR ECONOMICS*. Throughout the year. Credit three hours a term. Hours to be arranged. Mr. MONTGOMERY.

575. *PUBLIC FINANCE*. Spring term. Credit two hours. Hours to be arranged. Mr. KENDRICK.

675. *ECONOMIC HISTORY*. Throughout the year. Credit three hours a term. Hours to be arranged. Mr. HUTCHINS.

775. *INTERNATIONAL ECONOMICS*. Throughout the year. Credit three hours a term. Hours to be arranged. Mr. MORSE.

975. *ECONOMIC THEORY*. Throughout the year. Credit three hours a term. Hours to be arranged. Mr. COPELAND.

980. *HISTORY OF ECONOMIC THOUGHT*. Throughout the year. Credit three hours a term. Hours to be arranged. Mr. ADAMS.

## ENGLISH

Mr. F. E. MINEKA, *Chairman*; Messrs. M. H. ABRAMS, R. M. ADAMS, R. C. BALD, J. W. BICKNELL, RICHARD CARY, G. F. CRONKHITE, D. N. DENNETT, R. H. ELIAS, E. G. FOGEL, F. B. FREEMAN, W. H. FRENCH, BAXTER HATHAWAY, G. H. HEALEY, C. W. JONES, R. W. LANGBAUM, J. G. LINN, H. A. MYERS, DAVID NOVARR, J. D. OGDEN, E. B. PARTRIDGE, S. M. PRATT, MARK ROWAN, W. M. SALE, JR., R. J. SCHOECK, J. A. SESSIONS, HARVEY SHAPIRO, H. W. THOMPSON.

*For major work in English a student is required to complete (1) English 111-112, or the equivalent; (2) English 251-252, normally to be taken in the sophomore year; (3) twenty-four hours of other courses in the Department of English or the Division of Literature representing a reasonable distribution as to periods, authors, and forms; and (4) eighteen hours in related subjects. Selection of the twenty-four hours of English and the eighteen hours of related courses is subject to restrictions that will be explained by the major adviser or any member of the Department. Students especially interested in writing may take twelve of the twenty-four hours in English 385-386, 388, 389, 485-486, Speech and Drama 461-462.*

Courses numbered below 300 are introductory and are intended for underclassmen. All other courses are strictly limited to upperclassmen, except that those who have been excused from any part of English 111-112 may in their fourth term enter one course numbered above 300.

Students excused from English 112 may, in the second term of their freshman year, register in English 201, 203, 222, or 251, or Literature 101, but not in other courses in either department. Such exemptions, however, cannot be made until the student has completed English 111. In later terms, such students may register in any course to which English 111 and 112 are prerequisite.

Candidates for the degree of Bachelor of Arts with Honors in English are required to take six hours in the Department of English or in the Division of Literature, in addition to the twenty-four described in the preceding paragraph; these six hours may be in creative writing. Seminars in literary and critical problems, open only to Honors candidates, are available in the junior and senior years; from these, candidates are to elect nine of their thirty hours. A comprehensive examination for Honors will be given at the end of the senior year. See also the description of Courses 404-410.

Prospective teachers of English in secondary schools must elect a special sequence of required and related courses to satisfy the major requirements. They should consult Mr. MINEKA, preferably during their second term, before making out their program for the sophomore year.

**\*111-112. INTRODUCTORY COURSE IN READING AND WRITING.** Throughout the year. Credit three hours a term. Open to freshmen. English 111 is prerequisite to 112. M W F 8, 9, 10, 11, 12, 2, or 3; T Th S 8, 9, 10, 11, or 12. Mr. SALE and others.

The aim of this course is to increase the student's ability to communicate his own thought and to understand the thought of others.

## ENGLISH FOR FOREIGNERS.

*The following two courses are offered by the Division of Modern Languages. Foreign students should consult a member of that division at Morrill Hall 108.*

**102. ENGLISH FOR FOREIGNERS.** Fall term. Credit six hours. Prerequisite, placement by the instructor. Hours to be arranged.

**211. ENGLISH FOR FOREIGNERS.** Fall term. Credit six hours. Prerequisite, a satisfactory proficiency examination. Hours to be arranged.



## COURSES PRIMARILY FOR SOPHOMORES

201. *PROSE AND COMPOSITION*. Either term. Credit three hours. Prerequisite, English 111 and 112 or the equivalent. Fall term, M W F 9, 10. Spring term, M W F 9, 10. Mr. FRENCH and others.

Exposition with special attention to writing essays and reports; the paragraph; the outline; reading and analyzing expository prose; frequent practice in writing; personal conferences. Not open to those who have credit for English 203.

202. *PROSE AND COMPOSITION*. Spring term. Credit three hours. Prerequisite, English 201 or 203. Spring term, T Th S 9. Mr. SESSIONS.

A continuation of English 201; writing essays and stories; study of recent prose; personal conferences. Not open to those with credit for English 204.

203. *SPECIAL FORMS OF WRITING*. Either term. Credit three hours. Prerequisite, English 111 and 112 or the equivalent. Fall term, M W F 12 and conferences to be arranged. Spring term, T Th S 12 and conferences. Mr. SESSIONS.

Practice in writing verse, narrative, and the personal essay. The spring term section is intended primarily for freshmen excused from English 112. Not open to those who have credit for English 201.

204. *SPECIAL FORMS OF WRITING*. Spring term. Credit three hours. Prerequisite, English 201 or 203. M W F 12 and conferences to be arranged. Mr. SESSIONS.

A continuation of English 203; practice in writing verse, narrative, and the personal essay. Not open to those who have credit for English 202.

\*221. *INTRODUCTION TO POETRY*. Fall term. Credit three hours. Open to freshmen. M W F 10. Mr. OGDEN.

Selected English and American poems. A course intended to develop the understanding and enjoyment of poetry. May not be counted in satisfaction of the requirements for a major in English.

\*222. *INTRODUCTION TO FICTION*. Spring term. Credit three hours. Open to freshmen. M W F 10. Mr. ELIAS.

A course intended to develop the understanding and enjoyment of the short story and novel. May not be counted in satisfaction of the requirements for a major in English.

251. *GREAT ENGLISH WRITERS*. Either term. Credit three hours. T Th 11 and discussion sections to be arranged. Fall term, Mr. ——— and staff. Spring term, Mr. HEALEY and staff.

Studies in selected works of great English writers, Chaucer to the eighteenth century. Open to all students who have completed the requirement in English composition; those who have any intention of majoring in English should take this course and English 252 in the sophomore year.

252. *GREAT ENGLISH WRITERS*. Either term. Credit three hours. Prerequisite, English 251. T Th 11 and discussion sections to be arranged. Fall term, Mr. HEALEY and staff. Spring term, Mr. ABRAMS and staff.

Studies in selected works of great English writers from the eighteenth century to the twentieth.

## COURSES FOR UPPERCLASSMEN

*ENGLISH TRANSLATIONS OF GREEK AND LATIN CLASSICS.* (See Literature 201-202.)

305-306. *OLD ENGLISH PROSE AND POETRY.* Throughout the year. Credit three hours a term. T Th S 11. Mr. FRENCH.

Philology and literature from the Anglo-Saxon invasion to the Norman conquest. Most of *Beowulf* will be read in the second term. This course is recommended by the Department to all who intend to become graduate students in English.

*SURVEY OF MEDIEVAL LITERATURE.* (See Literature 211-212.)

309-310. *ENGLISH LITERATURE 1500-1660.* Throughout the year. Credit three hours a term. M W F 9. Mr. —.

Fall term: prose and poetry from More to Bacon. Spring term: prose and poetry from Donne to Marvell, excluding Milton.

*HUMANISM AND THE RENAISSANCE.* (See Literature 214.)

313-314. *ENGLISH LITERATURE 1660-1790.* Throughout the year. Credit three hours a term. T Th S 10. Mr. ABRAMS.

Major prose and poetry from Dryden to Blake; its relations to social and philosophic movements and to contemporary developments in the other arts.

317-318. *THE ROMANTIC PERIOD.* Throughout the year. Credit three hours a term. T Th S 11. Mr. —.

General literary tendencies and thought of the period. Poetry and prose of Wordsworth, Coleridge, Byron, Shelley, Keats, and others.

321-322. *THE VICTORIAN PERIOD.* Throughout the year. Credit three hours a term. M W F 11. Mr. MINEKA.

Poems, novels, essays, and plays of the major authors from Carlyle to Shaw, emphasizing the interest of men of letters in reconstruction and reform following the industrial and democratic revolutions.

[326. *MODERN ENGLISH POETRY.* Given in alternate years. Not given in 1951-52.]

329-330. *AMERICAN LITERATURE.* Throughout the year. Credit three hours a term. M W F 9. Fall term, Mr. MYERS. Spring term, Mr. ELIAS.

Fall term: Revolution to the Civil War. Spring term: 1865 to the present.

332. *AMERICAN LITERATURE (SPECIAL PROBLEMS).* Spring term. Credit one hour. Prerequisite, English 329, registration in English 330, and consent of the instructor. Th 12, Mr. ELIAS.

Not open to seniors. A course for students majoring in English or in American Studies. Enrollment limited to those recommended by reason of their previous work in English 329.

[335. *THE MODERN AMERICAN NOVEL.* Given in alternate years. Not given in 1951-52.]

337. *THE MODERN ENGLISH NOVEL.* Spring term. Credit three hours. M W F 10. Mr. SALE. (Will not be given in 1952-53.)

A critical study of English fiction, beginning with George Eliot and concluding with selected contemporary novels.

*EUROPEAN FICTION.* (See Literature 311-312.)

*DRAMA AND THE THEATRE.* (See Literature 301-302.)

341-342. *ENGLISH DRAMA.* Throughout the year. Credit three hours a term. T Th S 9. Mr. ———.

Representative English plays from the beginning to the twentieth century. Fall term: from the beginning to the Restoration. Spring term: from the eighteenth century to the twentieth.

*AMERICAN DRAMA AND THEATRE.* (See Speech and Drama 455.)

349. *RECENT AMERICAN POETRY.* Fall term. Credit three hours. M W F 12. Mr. FRENCH. (Will not be given in 1952-53.)

American poets from Robinson to the present; theories of poetry; reports and papers.

355. *AMERICAN FOLK-LITERATURE.* Fall term. Credit three hours. T Th S 9. Mr. THOMPSON.

Backgrounds of American life and literature revealed in traditional tales, ballads, proverbs, epitaphs, place-names, games, folk-science, and customs. Emphasis upon ballads and upon methods of collecting and classifying folklore.

357. *BALLAD AND FOLKTALE.* Spring term. Credit three hours. Prerequisite, English 355, or consent of the instructor. T Th S 9. Mr. THOMPSON.

An introduction to the science of folk-literature with special study of Child's *English and Scottish Popular Ballads* and Stith Thompson's *The Folktale*. Emphasis upon British and European materials.

[365. *CHAUCER'S EARLY WORKS.* Fall term. Credit three hours. Given in alternate years. Not given in 1951-52.]

366. *CHAUCER'S CANTERBURY TALES.* Spring term. Credit three hours. M W F 12. Mr. FRENCH.

A primarily literary study; brief reports; reading in writings about the fourteenth century.

369-370. *SHAKESPEARE.* Throughout the year. Credit three hours a term. M W F 11. Fall term, Mr. ———. Spring term, Mr. BALD. Fall term: comedies. Spring term: tragedies.

372. *SHAKESPEARE (SPECIAL PROBLEMS).* Spring term. Credit one hour. Prerequisite, English 369, registration in English 370, and consent of the instructor. T 11. Mr. BALD.

Not open to seniors. A course for students majoring in English. Enrollment limited to those recommended by reason of their previous work in English 369.

373. *MILTON.* Fall term. Credit three hours. T Th S 10. Mr. JONES.

A study of Milton's poetry and of selections from his prose.

[376. *AMERICAN COLONIAL LITERATURE.* Given in alternate years. Not given in 1951-52.]

377. *EMERSON, THOREAU, AND WHITMAN*. Spring term. Credit three hours. Prerequisite, English 329-330 or consent of the instructor. M W F 10. Mr. THOMPSON.

An intensive study of three major American writers with special attention to romanticism, transcendentalism, and democratic ideals and principles.

379. *POE, HAWTHORNE, AND MELVILLE*. Fall term. Credit three hours. Prerequisite, English 329-30 or consent of instructor. T Th S 9. Mr. FREEMAN.

A critical study of three major American writers with particular emphasis on their achievement of artistic form.

[380. *MARK TWAIN, HOWELLS, AND JAMES*. Given in alternate years. Not given in 1951-52.]

382. *THE ENGLISH LANGUAGE*. Spring term. Credit three hours. T Th S 10. Mr. FRENCH.

Problems of language: origin, derivation, semantics, usage, and other topics studied historically.

385-386. *NARRATIVE WRITING*. Throughout the year. Credit three hours a term. Prerequisite, consent of the instructor; ordinarily English 202 or 204 will be prerequisite. First term prerequisite to the second. T Th 11 and conferences to be arranged. Mr. HATHAWAY.

The technique of fiction; study of models; criticism of students' stories.

[388. *VERSE WRITING*. Given in alternate years. Not given in 1951-52.]

[389. *ADVANCED EXPOSITION*. Given in alternate years. Not given in 1951-52.]

485-486. *SEMINAR IN WRITING*. Throughout the year. Credit three hours a term. Prerequisite, consent of the instructor; ordinarily six hours from Courses 385-389 will be prerequisite. First term prerequisite to second. Th 2-4 and conferences to be arranged. Mr. HATHAWAY.

*PLAYWRITING*. (See Speech and Drama 461-462.)

*PRINCIPLES OF LITERARY CRITICISM*. (See Literature 401-402.)

*MODERN LITERARY CRITICISM*. (See Literature 421.)

#### SEMINARS FOR HONORS STUDENTS

*Junior Year: Two seminars will be offered in the spring term. Application for admission on forms obtainable from the secretary of the department should be filed not later than November 20. Students best qualified will be interviewed by Mr. Abrams before preregistration. Those accepted will become provisional candidates for the degree with honors.*

404. *APPROACHES TO LITERATURE: POETRY*. Spring term. Credit three hours. Prerequisite, provisional acceptance as a candidate for honors. M 2-4. Specific topic to be announced later.

406. *APPROACHES TO LITERATURE: FICTION AND DRAMA*. Spring term. Credit three hours. Prerequisite, provisional acceptance as a candidate for honors. T 2-4. Specific topic to be announced later.

*Senior Year: Two seminars will be offered throughout the year. Enrollment is limited to students recommended by the instructors of the junior seminars. Other students whose work in English during their first three years has been of high quality may apply for admission as candidates for Honors and will be considered if there are openings. Such students should make application not later than April 15 of their junior year in the manner prescribed for junior seminars.*

407-408. *PROBLEMS IN POETRY*. Throughout the year. Credit three hours a term. Th 2-4. Specific topic to be announced later.

409-410. *PROBLEMS IN THE NOVEL*. Throughout the year. Credit three hours a term. Beginning 1952-53, prerequisite, English 406 or some other course in the novel. T 2-4. Specific topic to be announced later.

## FAR EASTERN STUDIES

Mr. KNIGHT BIGGERSTAFF, *Chairman*; Mr. HERBERT W. BRIGGS; Miss GUSSIE E. GASKILL; Messrs. WILLIAM GEDNEY, CHARLES F. HOCKETT, MORRIS E. OPLER, N. ALLEN PATTILLO, E. P. REUBENS, HAROLD E. SHADICK, LAURISTON SHARP.

*For a major in Far Eastern Studies the student must have completed six hours of elementary area study selected from Far Eastern Studies 201, 202 and 206; the equivalent of twelve hours in a Chinese or Southeast Asian language; Far Eastern Studies 951-952; and twenty-four additional hours selected from the courses listed below.*

201. *INTRODUCTION TO CONTEMPORARY CHINA*. Spring term. Credit three hours. Not open to freshmen. M W F 9. Mr. BIGGERSTAFF, with some lectures by other members of the staff. (Probably will not be offered spring term 1953.)

Introduction to the land, the people, and the social, political, and economic life and organization of modern China. Attention is given to important historical developments, especially as they relate to the China of today. The political, ideological, and economic impact of the West on China is studied, and contemporary events are analyzed. Consideration is also given to Chinese foreign relations and to American policy toward China.

202. *INTRODUCTION TO CONTEMPORARY SOUTHEAST ASIA*. Fall term. Credit three hours. Not open to freshmen. T Th S 11. Mr. SHARP and other members of the staff.

Introduction to the land, the people, and the modern social, political, and economic life of Indochina, Thailand, Burma, Malaya, Indonesia, and the Philippines. Attention is given to the native culture base, to the background of colonialism or dependence from which this politically awakened region has emerged, and to the problems of modernization now faced by the 150,000,000 people of the area.

[206. *INTRODUCTION TO CONTEMPORARY INDIA*. Spring term. Credit three hours. Not open to freshmen. M W F 9. Mr. OPLER. Not offered in 1951-52.]

*ELEMENTARY COLLOQUIAL THAI*. Mr. GEDNEY. (See Thai 101, 102.)

*ELEMENTARY COLLOQUIAL CHINESE*. Mr. HOCKETT. (See Chinese 101, 102.)



*INTRODUCTION TO LITERARY CHINESE.* Mr. SHADICK. (See Chinese 201, 212.)

*INTERMEDIATE COLLOQUIAL CHINESE.* Mr. HOCKETT. (See Chinese 203, 214.)

*LINGUISTIC STRUCTURE OF CHINESE.* Spring term. Mr. HOCKETT. (See Chinese 232.)

*CHINESE LITERATURE IN TRANSLATION: PHILOSOPHICAL AND HISTORICAL LITERATURE.* Fall term. M W F 10. Mr. SHADICK. (See Literature 321.)

*CHINESE LITERATURE IN TRANSLATION: IMAGINATIVE LITERATURE.* Spring term. M W F 10. Mr. SHADICK. (See Literature 322.)

351-352. *READINGS IN CHINESE LITERATURE: CLASSICAL AND MODERN.* Throughout the year. Prerequisite: Chinese 212 and 214. Mr. SHADICK.

Texts selected to accord with the major interests of the students.

*HISTORY OF CHINESE CIVILIZATION.* M W F 12. Mr. BIGGERSTAFF. (See History 161-162.)

*THE MODERNIZATION OF CHINA.* M 2-4. Mr. BIGGERSTAFF. (See History 811-812.)

[*INTRODUCTION TO FAR EASTERN ART.* W 3-5. Mr. PATTILLO. (See Fine Arts 601-602.) Not offered in 1951-52.]

602. *CONTEMPORARY SOUTHEAST ASIA.* Fall term. Credit and hours to be arranged. Prerequisite 202 or equivalent, or may be taken concurrently with 202. Mr. SHARP and staff.

*SEMINAR: CULTURE AND CULTURE CHANGE IN INDIA.* Fall term. T 4-6. Mr. OPLER. (See Sociology and Anthropology 683.)

*SEMINAR: CULTURE AND CULTURE CHANGE IN SOUTHEAST ASIA.* Spring term. Th 4-6. Mr. SHARP. (See Sociology and Anthropology 685.)

[*ECONOMICS OF THE FAR EAST.* T Th S 10. Mr. REUBENS. (See Economics 801-802.) Not offered in 1951-52.]

*THE FAR EASTERN POLICY OF THE UNITED STATES.* Fall term. M W F 9. Mr. BRIGGS. (See Government 417.)

951-952. *SEMINAR IN FAR EASTERN STUDIES.* Throughout the year. Credit two hours a term; three hours a term for Far Eastern Studies majors. Open only to qualified seniors and graduate students. T 2-4. STAFF.

Discussion of selected topics concerning contemporary Eastern Asia. Each senior major will meet an additional hour each week with his major adviser, who will assist him to organize his knowledge, fill in gaps by means of a program of supervised reading, and prepare for the comprehensive examination required at the end of the senior year.

## THE FINE ARTS

Mr. F. O. WAAGE, *Chairman*; Mr. D. L. FINLAYSON, Mr. N. A. PATTILLO.

*Students who wish to do their major work in the Fine Arts will choose one of these two options:*

1. *GENERAL COURSE. In this option the following courses must be completed:*

- (1) *Aesthetics, nine hours, namely, Psychology 101 and Philosophy 230 and 481.*
- (2) (a) *Music, nine hours, including Music 101-102.*  
 (b) *Visual Arts, nine hours, including Fine Arts 101-102.*  
 (c) *Literature, nine hours, including Literature 101-102 or 301-302.*
- (3) *Twelve hours of approved advanced courses forming a logically coherent group within one of three fields: (a) Literature (literary history, criticism, writing, dramatics); (b) Visual Arts (history, practice); (c) Music (theory, composition, application).*

2. *VISUAL ARTS COURSE. In this option a student is required to complete (1) Fine Arts 101-102, 111-112; (2) eighteen hours of other courses in Fine Arts; and (3) fifteen hours in related subjects, including Psychology 101, Philosophy 230, and History 103-104 or the year course in either Ancient, Medieval, or Modern History. Students electing this option are encouraged, but not required to elect, courses in the practice of art given in the College of Architecture (see the Announcement of that College). A student, however, who, wishing to do graduate work in the practice of art, intends to qualify for admission to the Graduate School as a candidate for the M. F. A. degree, should elect thirty hours of such courses in the practice of art.*

## GENERAL COURSES

\*101-102. *INTRODUCTION TO ART.* Throughout the year. Credit three hours a term. Open to all students. M W F 12. Mr. WAAGE.

A survey of the general accomplishments in sculpture and painting of our own culture and those ancestral to it. The first term, which stresses sculpture, comes down to the Renaissance; the second term, which stresses painting, covers the Renaissance and Modern periods. The course attempts to illustrate the evolution of Western civilization in terms of its visual arts by showing how art forms arise as a natural consequence of the character of each culture period.

\*111-112. *INTRODUCTION TO ARCHITECTURE.* Throughout the year. Credit three hours a term. Open to all students. T Th S 11. Mr. PATTILLO.

A survey of the architecture of the Western World from ancient times to the present. The first term ends with the Romanesque period; the second begins with the Gothic.

## PRIMITIVE AND ANCIENT

[204. *PRIMITIVE ART: THE ART OF EARLY SOCIETIES.* Spring term. Credit three hours. Open to sophomores who have had Fine Arts 101-102 and to upper-classmen without prerequisite. M W F 10. Mr. WAAGE.

The shaping and use of art forms to satisfy the group needs of early cultures wherein art was an indispensable element of everyday life: Old Stone Age Europe, early Egypt, Africa, Australia, and the Americas (Mayas, Incas, etc.); with some consideration of the influence of these primitive and archaic forms on modern art. Not offered in 1951-52.]

## CLASSICAL

[301. *GREEK SCULPTURE*. Fall term. Credit three hours. Not open to freshmen. M W F 10. Mr. WAAGE.

A study of the sculpture of the first culture whose artistic forms developed beyond those of the archaic stage; the causes of this advance and the factors which conditioned it. Both the Hellenic and the Hellenistic periods are covered. Not offered in 1951-52.]

302. *ART OF THE ROMAN EMPIRE*. Fall term. Credit three hours. Not open to freshmen. M W F 10. Mr. WAAGE.

[315. *NUMISMATICS: ANCIENT COINAGE*. Spring term. Open to upperclassmen by consent of the instructor. Mr. WAAGE. Not offered in 1951-52.]

## MEDIEVAL

*ROMANESQUE AND GOTHIC SCULPTURE*. (Arch. 420.) Fall term. Credit three hours. Not open to freshmen. M W F 11. Mr. FINLAYSON.

Sculpture in the major European countries from 100 A.D. through the Gothic period. Offered in alternate years.

*GOTHIC PAINTING*. (Arch. 421.) Spring term. Credit three hours. Not open to freshmen. M W F 11. Mr. FINLAYSON.

Painting in Italy in the fourteenth century, and in France, Germany, and the Netherlands in the fourteenth and fifteenth centuries. Offered in alternate years.

## RENAISSANCE AND MODERN

505. *ITALIAN PAINTING*. Fall term. Credit three hours. Not open to freshmen. T Th S 9. Mr. PATTILLO.

The Renaissance painting of Italy, chiefly of the Florentine and Venetian Schools. Among the major artists whose lives and works will be studied are Fra Angelico, Masaccio, Piero della Francesca, Botticelli, Leonardo, Michelangelo, Raphael, Correggio, Giovanni Bellini, Giorgione, Titian, and Tintoretto.

506. *RENAISSANCE AND MODERN SCULPTURE*. Spring term. Credit three hours. Not open to freshmen. T Th S 9. Mr. PATTILLO.

A study of the main course of development of sculpture in Europe and America from fifteenth-century Italy to the present day, with emphasis in each period upon the works of a few representative artists.

*AMERICAN PAINTING* (Arch. 424). Fall term. Credit three hours. Open to upperclassmen. M W F 2. Mr. FINLAYSON.

Painting in the United States from colonial days to the present.

[*SEVENTEENTH AND EIGHTEENTH CENTURY PAINTING*. (Arch. 426.) Fall term. Credit three hours. Not open to freshmen. M W F 11. Mr. FINLAYSON.

Painting of the Baroque and Rococo periods in the major European countries. Offered in alternate years. Not offered in 1951-52.]

[*MODERN PAINTING* (Arch. 427). Spring term. Credit three hours. Not open to freshmen. M W F 11. Mr. FINLAYSON.

Nineteenth-century painting in France, England, Germany, and the major movements in twentieth-century painting. Offered in alternate years. Not offered in 1951-52.]

### FAR EASTERN

[601-602. *INTRODUCTION TO FAR EASTERN ART*. Throughout the year. Credit three hours a term. Not open to freshmen. W 3-5 with an occasional additional hour to be arranged. Mr. PATTILLO.

The architecture, sculpture, and painting of India to the Mohammedan conquest, and the art of China and Japan from the ancient Chinese bronzes to the nineteenth century. Not offered in 1951-52.]

### INFORMAL STUDY

*SEMINAR IN ART HISTORY* (Arch. 429). Spring term. Credit three hours a term. Prerequisite, consent of the instructor. Hours to be arranged. Mr. FINLAYSON.

Round-table discussion with student reports. A subject of interest to those registered in the course is selected each year. First term not offered in 1951-52.

### PRACTICE OF ART

*For courses in the practice of art and in architecture which may be elected by students in the College of Arts and Sciences, see the Announcement of the College of Architecture; these courses may not be counted in the ninety required hours of Arts courses.*

## GEOLOGY AND GEOGRAPHY

Mr. W. S. COLE, *Chairman*; Messrs. A. L. ANDERSON, J. D. BURFOOT, JR., W. T. HOLSER, C. M. NEVIN, J. W. WELLS.

*For a major in Geology the following courses must be completed: (1) in Geology, Courses 101-102, 207, 208, 209, 301, 303, 401, 601, 602, 901 and one-hour informal study in one of the divisions of the Department in the second semester of the senior year; (2) in related subjects, Mathematics 133, 171, and 172, or 161 and 162; General Chemistry 105-106; Introductory Physics 107-108; Engineering Drawing; and Plane Surveying. The following elective courses outside the Department are recommended: Mathematics 173, English 202-202; Public Speaking 101 and either 102 or 205; Statistics, Qualitative Analysis, Quantitative Analysis, Physical Chemistry, Advanced Physics, and Invertebrate Zoology.*

### COURSES WITHOUT PREREQUISITES

*These courses are open to freshmen, and others, without prerequisites.*

\*101-102. *GENERAL GEOLOGY*. Throughout the year; cannot be begun in the spring term. Credit three hours a term (if taken after Geology 115, two hours a term). Satisfies the science requirement of College of Arts and Sciences. Intended for undergraduates. May also be taken as a terminal course by upperclassmen who have satisfied the science requirement in the biological sciences. Lectures, T Th 11. Laboratory, M T W Th or F 2-4:30. Mr. COLE.

The course comprises an introduction to the various branches of geologic science: mineralogic, lithologic, physiographic, structural, glacial, historic, and economic. The

purpose of the course is to provide an adequate base for those who will major in geology and a comprehensive survey of earth science for the general student.

[\*105. *GENERAL GEOGRAPHY*. Fall term. Credit three hours. M W F 9. Mr. ——. Not given in 1951–52.]

\*108. *MINERAL RESOURCES*. Spring term. Credit three hours. Intended as a background course for all undergraduates interested in mineral resources for economics, history, government, industry and labor relations, etc. M W F 9. Mr. ANDERSON.

A geographic, cultural study of the nature, utilization, occurrence, distribution, production, consumption, reserves, and political and commercial control of the world's important mineral resources.

\*111. *ANCIENT LIFE*. Spring term. Credit three hours. No prerequisite but may well be preceded by Geology 101–102 or Geology 115. M W F 10. Mr. WELLS.

A cultural course devoted to a review of the fossil remains of life in the geologic periods as indicative of the continuity of organic evolution. Attention given chiefly to vertebrate forms from fish to man. For major students in Geology the course is a supplement to Geology 601–602.

113. *ENGINEERING GEOLOGY*. Either term. Credit three hours only. Students who have had Geology 101–102 or 115 may take 113 for one hour credit. Lectures, M W 11. Laboratory, M W or T Th 2–4:30. Mr. ANDERSON.

The purpose of the course is to provide a geologic background so that the engineer will be competent to adapt his work to conform with the limitations imposed by geologic conditions.

\*115. *ELEMENTARY GEOLOGY*. Either term. Credit three hours. Intended for underclassmen in Agriculture, and those in Arts and Sciences who do not plan to major in geology. This course cannot be used to satisfy the science group requirement of the College of Arts and Sciences. Lectures, T Th 11. Laboratory, M T W Th or F 2–4:30, or S 8–10:30, or S 10:30–1. Mr. NEVIN.

The purpose of the course is to present the fundamental principles of geology with emphasis on the physical aspects.

## SECOND COURSES

201. *HISTORIC GEOLOGY*. Fall term. Credit three hours. Prerequisite, Geology 101–102, or Geology 115. Lectures, M W 9. Laboratory, W 2–4:30. Mr. WELLS.

The course comprises a systematic study of the geologic history of the earth, with reference to the rock formations, from the earliest periods to the present: their nature and distribution, the orogenies, paleogeography, the fossil remains, and other characteristics on which their identification and correlation depend. Special emphasis is placed on American geology. Field studies, in the laboratory period, will be made insofar as weather and other circumstances permit. This course is designed not only for geology majors but also for students desiring a broad view of the physical history of the earth and the development of life through the ages.

207–208. *MINERALOGY*. Throughout the year. Credit three hours a term. Prerequisite, Chemistry 106. Fall term prerequisite to spring term. Mr. HOLSER. Lectures: fall term M W 10, spring term T Th 9. Laboratory, F 2–4:30.



Fall term: Fundamentals of crystal structure, with emphasis on symmetry; principles of crystal chemistry; relations of structure and chemistry to morphological, mechanical, optical, and other physical properties of crystals. Laboratory work includes demonstrations of these principles and relationship and their application in identification of minerals.

Spring term: Study of the common minerals by application of the fundamental concepts of the work of the fall term with emphasis on isomorphous substitution and modes of occurrence. Laboratory work stresses mineral identification and relationships.

209. *LITHOLOGY*. Spring term. Credit three hours. Prerequisite, Geology 101-102 and 207-208. Mr. BURFOOT. Lecture, M 12. Laboratories, T Th 2-4:30.

The mineral composition, texture, classification, identification, modes of origin, and properties of igneous, sedimentary, metamorphic, and metalliferous rocks, studied without the use of the petrographic microscope.

## STRUCTURAL GEOLOGY AND SEDIMENTATION

301. *STRUCTURAL GEOLOGY*. Fall term. Credit three hours. Prerequisite, Geology 101-102. Lectures, M W 11. Laboratory, M 2-4:30. Mr. NEVIN.

The purpose of the course is to classify and analyze geologic structures with reference to their nature and origin and in regard to their use in the interpretation of geologic problems.

303. *SEDIMENTATION*. Spring term. Credit three hours. Prerequisite, Geology 101-102. Registration limited. Intended for students who are majoring in Geology and those interested in the engineering problems related to sedimentation. Lectures, M W 11. Laboratory, M 2-4:30. Mr. NEVIN.

A study of the accumulation and ordering of sediments, together with critical discussions of the problems these present.

321. *PETROLEUM GEOLOGY*. Fall term. Credit three hours. Prerequisite, Geology 101-102. For students who intend to enter the oil industry. Lectures, M W 9. Laboratory, W 2-4:30. Mr. NEVIN.

The origin, distribution, and geology of petroleum and natural gas.

391-392. *SEMINAR IN STRUCTURAL GEOLOGY AND SEDIMENTATION*. Throughout the year. Credit variable. For advanced students. M 4:45. Mr. NEVIN.

395-396. *ADVANCED OR SPECIAL WORK IN SEDIMENTATION, STRUCTURAL, AND PETROLEUM GEOLOGY*. Throughout the year. Credit variable. Intended for advanced and graduate students in Geology. Prerequisite, consent of the instructor. F 9-11:30. Mr. NEVIN.

Original investigations, essential to the further training of the student in geologic interpretations.

030. *INFORMAL STUDY*. Mr. NEVIN. See italicized statement, p. 62.

## GEOMORPHOLOGY AND GLACIAL GEOLOGY

401. *GEOMORPHOLOGY*. Fall term. Credit three hours. Prerequisite, Geology 101-102. Lectures, T Th 9. Laboratory, T 2-4:30. Mr. —.

Description and interpretation of land forms in terms of structure, process, and stage.

[403. *GLACIERS AND THE PLEISTOCENE EPOCH*. Spring term. Credit three hours. Prerequisite, Geology 101-102. Lectures, T Th 10. Laboratory, T 2-4:30. Mr. ——. Alternate year course; not given in 1951-52.]

495-496. *ADVANCED OR SPECIAL WORK IN GEOGRAPHY, GEOMORPHOLOGY OR GLACIAL GEOLOGY*. Credit variable. Prerequisite, consent of the instructor. For advanced and graduate students. M 7 p.m. Mr. ——.

040. *INFORMAL STUDY*. Mr. ——. See italicized statement, p. 62.

## MINERALOGY AND PETROLOGY

501. *OPTICAL MINERALOGY*. Fall term. Credit three hours. Prerequisite, Geology 207-208. Mr. HOLSER. Lecture, W 12. Laboratories, F 8-10:30 and S 9-11:30, McGraw 345.

Expansion of the theory of optical properties of crystals as developed in Geology 207. Application of the theory to the determination and study of minerals with the petrographic microscope. The common rock-forming minerals are studied in fragments and in thin sections.

502. *PETROGRAPHY*. Spring term. Credit three hours. Prerequisite, Geology 501; prerequisite or parallel, Geology 209. Mr. BURFOOT. Lecture, W 9. Laboratories, F 8-10:30, S 9-11:30.

A study of the mineral and chemical composition, and texture of igneous, sedimentary, and metamorphic rocks; their classification and determination by means of the petrographic microscope.

521. *SEDIMENTARY PETROGRAPHY*. Fall term. Credit three hours. Prerequisites, Geology 209 and 501. Mr. BURFOOT. Lectures, M W 9. Laboratory, F 10:30-1. Alternate year course; given in 1951-52.

The methods of investigating the mineral composition, the texture, and other physical characteristics of sedimentary rocks, and some of the applications of these methods to geological problems. Emphasis is placed on the methods of preparation of mineral grains for study and on the identification and interpretation of these grains by means of the petrographic microscope.

575. *IGNEOUS PETROGENY*. Fall term. Credit three hours. Prerequisite, Geology 502. Mr. BURFOOT. Lectures, M W 9. Laboratory, F 10:30-1. Alternate year course; not given in 1951-52.]

[577. *METAMORPHIC GEOLOGY*. Fall term. Credit three hours. Prerequisites, Geology 502 and 301; recommended, Geology 702. Mr. BURFOOT. Lectures, M W 9. Laboratory, F 10:30-1. Alternate year course; not given in 1951-52.]

[581. *STRUCTURAL MINERALOGY*. Spring term. Credit three hours. Prerequisites, Geology 208, Physics 108. Required parallel, laboratory work on X-rays in Department of Physics. Credit one hour. See special circular of Department of Geology. Mr. HOLSER. Lectures, M W 11. Laboratory, F 10:30-1. Alternate year course; not given in 1951-52.]

583. *CHEMICAL MINERALOGY*. Spring term. Credit three hours. Prerequisite,

Geology 208; recommended but not required: Geology 501 and 581 and Chemistry 408. Mr. HOLSER. Lectures, M W 11. Laboratory, F 10:30-1. Alternate year course; given in 1951-52.

Principles of physical chemistry in their application to mineralogy. Thermodynamic equilibria; effects of temperature, pressure, and stress; anhydrous systems; volatile components; solubilities in solids, liquids, and gases; colloidal phenomena. Viscosity, reaction rates, diffusion processes. Geochemical distribution of the elements and their isotopes. Applications to problems in igneous, metamorphic, sedimentary, and metalliferous rocks discussed throughout; readings in current and classical literature. Laboratory adapted to individual needs and may include gravimetric, universal stage, thermal, spectroscopic, or other advanced methods of chemical determination.

591-592. *SEMINAR IN MINERALOGY AND PETROLOGY*. Throughout the year. Credit one hour a term. Prerequisite, permission of instructor. Mr. HOLSER and Mr. BURFOOT. W 4:45.

Literature, special topics, advanced methods. For all interested students; attendance expected of majors and minors in mineralogy and petrology.

595-596. *ADVANCED OR SPECIAL WORK IN MINERALOGY AND PETROLOGY*. Throughout the year. Credit variable. Prerequisites, variable. Mr. BURFOOT and Mr. HOLSER. Days and hours to be arranged.

Adapted to the needs of the individual student. Advanced methods, special problems, research.

050. *INFORMAL STUDY*. Mr. BURFOOT, Mr. HOLSER. See italicized statement, p. 62.

### PALEONTOLOGY AND STRATIGRAPHY

601-602. *INVERTEBRATE PALEONTOLOGY*. Throughout the year. Credit three hours a term. Prerequisite, Geology 101-102 and, if possible, invertebrate zoology. Intended for students who are majoring in geology and for students in biology interested in the fossil evidence of the development of organisms. Lectures, T Th 10. Laboratory: fall term, Th 2-4:30, spring term, W 2-4:30. Mr. COLE, Mr. WELLS.

Fall term: paleobiology and classification of important fossil invertebrate organisms. Spring term: key fossils of the geologic periods. Certain laboratory periods will be devoted to the collection and determination of fossil assemblages from selected horizons of the Paleozoic formations of central New York.

605-606. *STRATIGRAPHY*. Throughout the year. Credit three hours a term. Prerequisites, Geology 101-102 and first term of 601-602. Intended for students majoring in geology, T Th 9, W 10. Mr. COLE, Mr. WELLS.

The principles of stratigraphy, developed by detailed study of selected American and European systemic examples. Fall term: the Paleozoic. Spring term: the Mesozoic and Cenozoic.

675. *MICROPALEONTOLOGY*. Spring term. Credit two hours. Prerequisite, consent of the instructor; preparation should include Geology 101-102, 201, 601-602, and 605. Not open to underclassmen. Intended for students who are majoring in geology and graduates, especially those who are planning careers in the geology of petroleum deposits. W 9 and hours to be arranged. Mr. COLE.

Study of the microfossils, chiefly Foraminifera, in their relation to the correlation

of strata, as used in the development of oil fields. The course is designed for advanced students in paleontology.

681. *STRATIGRAPHY OF NEW YORK STATE*. Spring term. Credit two hours. Prerequisites, Geology 101-102, 601-602, 605, or consent of the instructor. Intended for upperclassmen and graduates in geology and others with the necessary training. The course will be given only if sufficient numbers of qualified students register. Lectures in winter months, all-day field trips in spring months. T Th 12. Mr. WELLS.

The classic Paleozoic section of Central New York will be studied through lectures, readings, and field observations.

695-696. *ADVANCED OR SPECIAL WORK IN PALEONTOLOGY AND STRATIGRAPHY*. Throughout the year. Credit variable. Prerequisite, Geology 601-602 and 605. Intended for upperclassmen majoring in geology, and graduates. W 7 p.m. Mr. COLE.

The purpose of the course is to provide for direction in the study of particular problems in paleontology and stratigraphy, adapted to the needs of the individual student.

060. *INFORMAL STUDY*. Mr. COLE, Mr. WELLS. See italicized statement, p. 62.

## ECONOMIC GEOLOGY

701-702. *GENERAL ECONOMIC GEOLOGY*. Throughout the year. Credit three hours a term. Prerequisites, Geology 101-102, or 113, and 208, or consent of the instructor. Intended for geology majors, and for chemistry, chemical engineering, and civil engineering students interested in industrial source materials. Lectures, T Th 11. Laboratory, F 2-4:30. Mr. ANDERSON.

Nature, mode of occurrence, distribution, and utilization of the more important mineral deposits. The work of the fall term concerns nonmetalliferous deposits; in the spring term, the metalliferous deposits. Field trips are included as a part of the laboratory work. The purpose of the course is to give the student a geologic background knowledge of the properties, occurrence, etc., of the minerals and rocks of value to man.

712. *METALLURGICAL RAW MATERIALS*. Fall term. Credit three hours. For second-year students in metallurgical engineering. Mr. ANDERSON. Lectures, M W F 10.

The source, occurrence, associations, distribution, and economic aspects of the commercially important ore, refractory, and fluxing materials that enter metallurgical operations.

[721. *MICROSCOPIC STUDY OF ORE MINERALS*. Fall term. Credit two hours. Prerequisite, Geology 207-208. Mr. ANDERSON. F 8-10:30, S 9-11:30. Alternate year course; not given in 1951-52.]

[732. *MINING GEOLOGY*. Spring term. Credit three hours. Prerequisites, Geology 701-702. Mr. ANDERSON. M W F 1. Alternate year course; not given in 1951-52.]

775-776. *MINERAL DEPOSITS*. A two-term course. Credit three hours a term. Prerequisites, Geology 701-702. Mr. ANDERSON. Lectures, M W F 8. Alternate year course; given in 1951-52.

Structural occurrence and origin of the economically important mineral deposits. Fall term: the deposits of primary origin associated more or less closely with igneous phenomena; spring term: the deposits of secondary origin associated more or less directly with processes of weathering and sedimentation.

791-792. *SEMINAR IN ECONOMIC GEOLOGY*. Throughout the year. Credit one hour a term. Registration by invitation of the instructor. Intended primarily for majors and minors in economic geology. T 4:45. Mr. ANDERSON.

Seminar designed to keep the student abreast of current advances in the field of economic geology.

795-796. *ADVANCED OR SPECIAL WORK IN ECONOMIC GEOLOGY*. Throughout the year. Credit variable. Prerequisites dependent on nature of the work, but Geology 208, 501 and 701-702 (or 721-722) are ordinarily required. Intended for graduate majors in economic geology. T 12. Mr. ANDERSON.

Work designed to meet the needs and training of the student. May include research in economic geology or guided study of advanced or special problems in economic geology.

070. *INFORMAL STUDY*. Mr. ANDERSON. See italicized statement, p. 62.

## FIELD COURSES

901. *GEOLOGIC MAPPING*. Given at the Summer Field Camp. Credit six hours. Mr. NEVIN.

Instruction in the fundamental methods used in geologic mapping, together with practical work in the field. For students majoring in geology. Special circular from the Department on request.

[912. *GEOLOGIC INTERPRETATION OF AERIAL PHOTOGRAPHS*. Fall term. Credit three hours. Prerequisite, Geology 301. Intended for majors in geology. Lecture, M 12. Two laboratories by arrangement. Mr. WELLS. Alternate year course; not given in 1951-52.]

## GOVERNMENT

Mr. MARIO EINAUDI, *Chairman*; Messrs. HERBERT W. BRIGGS, ROBERT E. CUSHMAN, CLINTON L. ROSSITER.

*For a major in Government the following courses must be completed: (1) Government 101 and either Government 102 or 104; (2) eighteen additional hours in the Department; (3) in related subjects, twenty-four hours selected with the approval of the adviser from courses (other than the introductory courses) in Economics, History, Philosophy, Sociology and Anthropology, Business and Public Administration, Industrial and Labor Relations, and Regional Planning. Of the hours in related subjects, at least twelve must be in History.*

*Juniors and seniors majoring in the Department who have a grade of 85 or better in one half of the hours they have passed may take informal study in Government.*

*Candidates for Honors in Government should consult the Chairman prior to the beginning of the senior year. They will be required to take three hours of informal study during each semester of the senior year. They will also be required to pass a comprehensive examination.*

*Students registered in the combined Arts-Law, or Arts-Business and Public Administration courses with a major in Government will be required to take (1) Government 101 and either Government 102 or 104; (2) twelve additional hours in the Department; (3) in related subjects, fourteen hours.*



## AMERICAN GOVERNMENT AND INSTITUTIONS

\*101. *AMERICAN NATIONAL GOVERNMENT*. Fall term. Credit three hours. Open to all students, although primarily intended for freshmen. Lectures, T Th 2. Discussion sections to be arranged. Mr. CUSHMAN and Mr. ROSSITER.

A general introduction to American national government and politics. Emphasis will be placed upon historical development, organization, powers, and practical working.

\*102. *STATE AND LOCAL GOVERNMENT*. Spring term. Credit three hours. Open to all students, although primarily intended for freshmen. Lectures, T Th 2. Discussion sections to be arranged. Mr. ———.

American state and local governments, their historical development, organization, powers, and practical working.

[213. *CONGRESS: ORGANIZATION AND METHODS OF WORK*. Fall term. Credit three hours. Open to upperclassmen and sophomores who have had Government 101 or 102. M W F 2. Not offered in 1951-52.]

216. *THE AMERICAN PRESIDENCY*. Spring term. Credit three hours. Open to upperclassmen who have had Government 101. M W F 11. Mr. ROSSITER.

Analysis of the office and powers of the President, with emphasis on his functions as chief administrator, commander-in-chief, leader of legislation, political leader, and chief of foreign relations. The lives and accomplishments of the important Presidents are studied at length.

[218. *AMERICAN POLITICAL PARTIES*. Spring term. Credit three hours. Open to sophomores and upperclassmen. Prerequisite, Government 101. M W F 2. Mr. ROSSITER. Not offered in 1951-52.]

231-232. *PUBLIC ADMINISTRATION*. Throughout the year. Credit three hours a term. Open to upperclassmen. M W F 10. Mr. ———.

Principles and problems of administrative organization, the civil service, fiscal management, administrative law, methods of administrative action, and control of bureaucracy.

235. *AMERICAN POLITICAL AND CONSTITUTIONAL THEORY*. Fall term. Credit three hours. Open to upperclassmen. Prerequisite, Government 101 or History 151-152. M W F 11. Mr. ROSSITER.

Survey of the development of American political and constitutional thought, with emphasis on the interaction of history and ideas. The following schools and problems are studied at length: Puritanism, pre-Revolutionary democratic thought, the American Revolution, Constitutionalism and Federalism, Jeffersonian democracy, Jacksonian democracy, intellectual democracy, neo-federalism, slavery, the nature of the union, collectivism v. individualism, the welfare state, American conservatism.

236. *PRINCIPLES AND PROBLEMS OF AMERICAN DEMOCRACY*. Spring term. Credit three hours. Open to upperclassmen. Prerequisite, Government 235 and the consent of the instructor. M W F 2. Mr. ROSSITER.

A critical examination of selected political and social problems currently facing the American people, with emphasis upon the extent to which possible solutions to these problems conform to the American tradition and to which the tradition may have to be redefined in the light of present realities.

241. *CONSTITUTIONAL LAW: THE AMERICAN FEDERAL SYSTEM*. Fall term. Credit three hours. Open to upperclassmen. Prerequisite, Government 101 or consent of the instructor. T Th S 11. Mr. CUSHMAN.

Judicial interpretation of the Constitution; the nature of judicial review; separation of government powers; relations between state and national governments; construction of national powers.

242. *CONSTITUTIONAL LAW: FUNDAMENTAL RIGHTS AND IMMUNITIES*. Spring term. Credit three hours. Open to upperclassmen. Prerequisite, Government 101 or consent of the instructor. T Th S 11. Mr. CUSHMAN.

Privileges and immunities of citizenship; protection of civil and political rights; the obligation of contracts; due process of law and the equal protection of the laws.

275-276. *SEMINAR IN CONSTITUTIONAL PROBLEMS*. Throughout the year. Credit two hours a term. Open to graduate students and qualified seniors. Hours to be arranged. Mr. CUSHMAN.

295-296. *SEMINAR IN AMERICAN POLITICAL THEORY AND INSTITUTIONS*. Throughout the year. Credit three hours a term. Open to graduate students and qualified seniors. Hours to be arranged. Mr. ROSSITER.

050. *INFORMAL STUDY*. Mr. ROSSITER. See italicized statement, p. 68.

090. *INFORMAL STUDY*. Mr. CUSHMAN. See italicized statement, p. 68.

## COMPARATIVE GOVERNMENT AND POLITICAL THEORY

\*104. *COMPARATIVE GOVERNMENT*. Spring term. Credit three hours. Open to all students, although primarily intended for freshmen. Lectures, T Th 2. Discussion sections to be arranged. Mr. EINAUDI.

A comparative study of basic governmental institutions and processes, with major emphasis on Europe.

[311. *CONSTITUTIONAL GOVERNMENT OF EUROPE*. Fall term. Credit three hours. Open to sophomores and to upperclassmen. Mr. EINAUDI. Not offered in 1951-52.]

[321. *DEVELOPMENT OF MODERN POLITICAL THOUGHT*. Fall term. Credit three hours. Open to sophomores with consent of the instructor and to upperclassmen. T Th S 10. Mr. EINAUDI. Not offered in 1951-52.]

322. *CONTEMPORARY POLITICAL THOUGHT*. Spring term. Credit three hours. Open to sophomores with the consent of the instructor and to upperclassmen. T Th S. 10. Mr. EINAUDI.

A study of the major currents in political thought in the nineteenth and twentieth centuries.

[331. *PUBLIC CONTROL OF ECONOMIC LIFE*. Fall term. Credit three hours. Open to upperclassmen. Th S 9. A third hour to be arranged. Mr. EINAUDI. Not offered in 1951-52.]

[375-376. *SEMINAR IN POLITICAL THEORY*. Throughout the year. Credit three hours a term. Open to graduate students and qualified seniors. Hours to be arranged. Mr. EINAUDI. Not offered in 1951-52.]

[385-386. *SEMINAR IN COMPARATIVE CONSTITUTIONAL LAW*. Throughout the year. Credit three hours a term. Open to graduate students and qualified seniors. Hours to be arranged. Mr. EINAUDI. Not offered in 1951-52.]

060. *INFORMAL STUDY*. Mr. EINAUDI. See italicized statement, p. 68.

## INTERNATIONAL RELATIONS

[411. *INTERNATIONAL POLITICS*. Fall term. Credit three hours. Open to sophomores and to upperclassmen. M W F 9. Mr. BRIGGS. Not offered in 1951-52.]

414. *INTERNATIONAL ORGANIZATION*. Spring term. Credit three hours. Open to sophomores and to upperclassmen. M W F 9. Mr. BRIGGS.

An analysis of international governmental procedures and institutions; international administration; international legislation; power politics and collective efforts to maintain international peace and security; the League of Nations; the United Nations and specialized agencies; the judicial function and the International Court of Justice.

417. *THE FAR EASTERN POLICY OF THE UNITED STATES*. Fall term. Credit three hours. Open to sophomores and to upperclassmen. M W F 9. Mr. BRIGGS.

An analysis of the relations of the United States with China, Japan, and the European powers with Far Eastern interests, primarily since 1898.

441-442. *INTERNATIONAL LAW*. Throughout the year. Credit three hours a term. Open to qualified upperclassmen. M W F 12. Mr. BRIGGS.

A systematic study of the nature, development, and judicial application of the principles of international law. Cases, readings, and discussions.

475-476. *SEMINAR IN INTERNATIONAL LAW AND INTERNATIONAL ORGANIZATION*. Throughout the year. Credit two hours a term. Open to graduate students and qualified seniors. Hours to be arranged. Mr. BRIGGS.

080. *INFORMAL STUDY*. Mr. BRIGGS. See italicized statement, p. 68. Consult the instructor.

## HISTORY

Mr. PAUL W. GATES, *Chairman*; Messrs. KNIGHT BIGGERSTAFF, E. W. FOX, H. E. GUERLAC, M. L. W. LAISTNER, F. G. MARCHAM, C. P. NETTELS, CARL STEPHENSON, MARC SZEFTTEL.

*For a major in History the following courses must be completed: (1) in History, at least thirty hours; (2) in related subjects, at least eighteen hours which shall be determined by the student in consultation with his adviser. Of the hours in related subjects at least six shall be in other than introductory courses.*

\*101-102. *ANCIENT HISTORY*. Throughout the year. Credit three hours a term. M W F 9. Mr. LAISTNER.

The work of the first term will include: 1) a brief survey of Stone and Bronze Age cultures in Europe and the Near East, and of the early civilizations of Mesopotamia, Egypt, Asia Minor, and the Eastern Aegean; 2) a fuller treatment of the political, economic, and cultural history of the Greek World to 146 B.C. The second term will

be devoted to the early history of Rome and other Italian communities; the emergence of Rome as the chief power, first in Italy, and then, in the Western Mediterranean; and, finally, the development and culture of the Roman Empire to the death of Constantine.

\*103-104. *DEVELOPMENT OF WESTERN CIVILIZATION*. Throughout the year. Credit three hours a term. History 103 or consent of the instructor is prerequisite to History 104. Open to freshmen and sophomores who have not had History 101-102, 107-108, or 115-116. T Th S 9. Mr. FOX and assistants.

This is a broad introductory survey of European history and of Europe's place in world affairs from the time of the ancient Greeks to the present, emphasizing the chief intellectual, political, and economic developments that have contributed to the formation of our Western civilization. It is designed to provide a systematic introduction to the study of history at the college level and of the relation of historical methods and materials both to other academic subjects and to contemporary problems. A lecture course with weekly section meetings. Attention is called to the fact that students enrolled in both History 103 and Literature 101 are eligible to register for the special section in Literature 101.

\*107-108. *ENGLISH HISTORY FROM ANGLO-SAXON TIMES TO THE PRESENT*. Throughout the year. Credit three hours a term. Open to freshmen. Students who have had History 103-104 and History 115-116 must secure the consent of the instructor. T Th S 8. Mr. MARCHAM and assistants.

This introductory course traces the growth of government, economic life, religion, the arts, and society among the English people. It illustrates in the history of one nation some of the principal developments of Western Civilization since Roman times, such as feudalism, the Catholic Church, the nation-state, the Renaissance, the Industrial Revolution, the overseas empire, and state socialism. Lectures and discussion groups. Some of the written work is designed to give elementary training in the interpretation of documentary evidence.

115. *MEDIEVAL HISTORY*. Fall term. Credit three hours. Not open to students who have taken History 103-104. M W F 10. Mr. STEPHENSON.

An introduction to the history of the Middle Ages. Lectures, reading, and map work.

116. *EUROPEAN HISTORY, 1500-1815*. Spring term. Credit three hours. Not open to students who have taken History 103-104. M W F 10. Mr. STEPHENSON.

A sketch of the period indicated above. Lectures, reading, and map work.

147. *HISTORY OF RUSSIA TO 1917*. Fall term. Credit three hours. T Th S 9. Mr. SZEFTTEL.

Beginnings of Russia, evolution of political institutions and social structure under the Empire, economic development, reform and revolutionary action, main cultural trends, external relations.

148. *THE RUSSIAN REVOLUTION AND THE SOVIET PERIOD*. Spring term. Credit three hours. T Th S 9. Mr. SZEFTTEL.

Causes of the Revolution and its development. Problems of economic, social, political, and cultural life from October, 1917, to the present.

151. *AMERICAN HISTORY, 1607-1861*. Fall term. Credit three hours. M W F 9. Mr. GATES. M W F 11, Mr. NETTELS.

152. *AMERICAN HISTORY, 1861 TO THE PRESENT*. Spring term. Credit three hours. M W F 9, Mr. GATES. M W F 11, Mr. NETTELS.

161. *HISTORY OF CHINESE CIVILIZATION: TO 1842*. Fall term. Credit three hours. M W F 12. Mr. BIGGERSTAFF.

A rapid survey of the more significant Chinese cultural developments from earliest times until the establishment of formal relations with the West.

162. *HISTORY OF CHINESE CIVILIZATION: SINCE 1842*. Spring term. Credit three hours. M W F 12. Mr. BIGGERSTAFF.

A more detailed survey of Chinese history since the beginning of significant Western influence.

165-166. *SCIENCE IN WESTERN CIVILIZATION*. Throughout the year. Credit three hours a term. History 165, or consent of the instructor, is prerequisite to History 166. Primarily for engineers and science majors, but open to other qualified upperclassmen. M W F 11. Mr. GUERLAC.

A survey of the development of science in its relation to European and American civilization.

211. *GREEK HISTORY, 500-323 B.C.* Fall term. Credit three hours. Prerequisite, History 101 or the equivalent. M W F 11. Mr. LAISTNER.

[212. *THE HELLENISTIC AGE*. Spring term. Credit three hours. Prerequisite, History 101 and 102 or a satisfactory equivalent. M W F 11. Mr. LAISTNER. Not offered in 1951-52.]

[213. *THE ROMAN REPUBLIC, 133-30 B.C.* Fall term. Credit three hours. Prerequisite, History 101 and 102 or a satisfactory equivalent. M W F 11. Mr. LAISTNER. Not offered in 1951-52.]

214. *THE ROMAN EMPIRE, 30 B.C.-A.D. 180*. Spring term. Credit three hours. Prerequisite, History 101 and 102 or a satisfactory equivalent. M W F 11. Mr. LAISTNER.

310. *MEDIEVAL SOCIETY, LEARNING, AND EDUCATION*. Spring term. Credit three hours. Students should consult the instructor before registering. Hours to be arranged. Mr. STEPHENSON.

An advanced course conducted as a seminar, emphasizing discussion of the following topics: the decline of the Roman Empire, agrarian organization, feudalism, the intellectual heritage of the ancient world and ecclesiastical tradition, Carolingian schools, commerce and the growth of towns, the rise of the universities, later medieval developments.

[421. *THE EUROPEAN REVOLUTION, 1789-1848*. Fall term. Prerequisite, History 104 or consent of the instructor. A reading knowledge of French is required. W F 2:00-3:30. Mr. FOX. Not offered in 1951-52.]

423. *MODERNIZATION OF EUROPE*. Fall term. Credit three hours. Prerequisite, History 104 or consent of the instructor. W F 2-3:30. Mr. FOX.

The history of Europe in the nineteenth century, beginning with a review of the



industrial revolution in England and the political revolution in France and tracing the impact of each on the continent with emphasis on their political and social consequences in France and Germany. A discussion course conducted at an advanced level.

[424. *EVOLUTION OF THE FRENCH REPUBLIC*. Spring term. Credit three hours. Prerequisite, History 104 or consent of the instructor. A reading knowledge of French is required. W F 2-3:30. Mr. FOX. Not offered in 1951-52.]

[426. *ORIGINS OF THE THIRD REICH*. Spring term. Credit three hours. Prerequisite, History 104 or consent of the instructor. W F 2-3:30. Mr. FOX. Not offered in 1951-52.]

427. *EUROPE IN THE TWENTIETH CENTURY*. Spring term. Credit three hours. Prerequisite, History 104 or consent of the instructor. W F 2-3:30. Mr. FOX.

From the origins of the first World War to the present, with special attention to the relation of internal political, economic, and social developments to international affairs. A discussion course conducted at an advanced level.

[455-456. *INTELLECTUAL HISTORY OF MODERN RUSSIA*. Throughout the year. Credit three hours a term. Prerequisite, History 147-148 or consent of the instructor. T Th 2:00-3:30. Mr. SZEFTTEL. Not offered in 1951-52.]

457. *RUSSIAN HISTORIOGRAPHY*. Fall term. Credit three hours. Prerequisite, History 147-148 or consent of the instructor. T Th 2-3:30. Mr. SZEFTTEL.

458. *KIEV RUSSIA AND MOSCOVY*. Spring term. Credit three hours. Prerequisite, History 147-148 or consent of the instructor. T Th 2-3:30. Mr. SZEFTTEL.

495-496. *SEMINAR IN RUSSIAN AREA STUDIES*. Throughout the year. Credit and hours to be arranged. Open to seniors and graduate students. Prerequisite, consent of Mr. FAIRBANKS. Messrs. SZEFTTEL, CLARK, FAIRBANKS, NABOKOV, and others.

Selected topics concerning problems of Russian culture in its different aspects.

511. *ENGLISH CONSTITUTIONAL HISTORY TO 1485*. Fall term. Credit three hours. Prerequisite, History 103, or History 107, or History 115, or consent of the instructor. M W F 2. Mr. STEPHENSON.

512. *ENGLISH CONSTITUTIONAL HISTORY SINCE 1485*. Spring term. Credit three hours. Prerequisite, History 107 and 108, or History 116, or consent of the instructor. T Th S 11. Mr. MARCHAM.

The nature and causes of the principal changes in the government of Great Britain and her Empire.

[515. *HISTORY OF ENGLAND UNDER THE TUDORS*. Fall term. Credit three hours. Prerequisite, History 107-108 or consent of the instructor. T Th S 11. Mr. MARCHAM. Not offered in 1951-52.]

[516. *HISTORY OF ENGLAND UNDER THE STUARTS*. Spring term. Credit three hours. Prerequisite, History 107-108 or consent of the instructor. T Th S 11. Mr. MARCHAM. Not offered in 1951-52.]

517. *HISTORY OF ENGLAND IN THE NINETEENTH CENTURY*. Fall term. Credit three hours. Prerequisite, History 107-108 or consent of the instructor. T Th S 11. Mr. MARCHAM.

[518 *HISTORY OF ENGLAND IN THE TWENTIETH CENTURY*. Fall term. Credit three hours. Prerequisite, History 107-108 or consent of the instructor. T Th S 11. Mr. MARCHAM. Not offered in 1951-52.]

The principal changes in the political, economic, social, and intellectual life of Great Britain and the Empire. Readings in contemporary literature.]

711. *AMERICAN COLONIAL HISTORY TO 1763*. Fall term. Credit three hours. For upperclassmen and graduates. T Th 12 and an hour to be arranged. Mr. NETTELS.

712. *THE AGE OF WASHINGTON, 1763-1800*. Spring term. Credit three hours. For upperclassmen and graduates. T Th 12 and an hour to be arranged. Mr. NETTELS.

The struggle for American independence, the making of the Constitution, the founding of the federal government, and the shaping of national policies.

[717. *AMERICAN BIOGRAPHY*. Fall term. Credit three hours. For upperclassmen and graduates. T Th 12 and an hour to be arranged. Mr. NETTELS. Not offered in 1951-52.]

Studies in the work and influence of leaders in various fields of activity who are representatives of main factors or trends in American History.]

[721-722. *AMERICAN HISTORY: HISTORY OF THE WEST*. Throughout the year. Credit three hours a term. M W F 12. Mr. GATES. Not offered in 1951-52.]

725-726. *RECENT AMERICAN HISTORY*. Throughout the year. Credit three hours. An intensive course for upperclassmen. M W F 12. Mr. GATES.

811. *MODERNIZATION OF CHINA: 1842-1911*. Fall term. Credit two hours. Prerequisite, History 162 or consent of the instructor. M 2-4. Mr. BIGGERSTAFF.

Topical study of the impact of Western civilization upon traditional China.

812. *MODERNIZATION OF CHINA: SINCE 1911*. Spring term. Credit two hours. Prerequisite, History 162 or consent of the instructor. M 2-4. Mr. BIGGERSTAFF.

Topical study of changes in China since the Revolution of 1911.

911. *ORIGINS OF MODERN SCIENCE*. Fall term. Credit three hours. Prerequisite History 165-166 or consent of instructor. Alternates with History 913. Hours to be arranged. Mr. GUERLAC.

[913. *ORIGINS OF MODERN SCIENCE*. Fall term. Credit three hours. Prerequisite, History 165-166 or consent of the instructor. Mr. GUERLAC. Not offered in 1951-52.]

916. *THE CENTURY OF THE ENLIGHTENMENT*. Spring term. Credit three hours. M W F 9. Mr. GUERLAC.

The thought of the eighteenth century from Bayle and Fontenelle through the French Revolution, with special reference to the influence of scientific ideas.

## LITERATURE

——, *Chairman*; Messrs. H. D. ALBRIGHT, HARRY CAPLAN, JAMES HUTTON, C. W. JONES, VICTOR LANGE, H. A. MYERS, V. NABOKOV, W. M. SALE, JR., H. E. SHADICK, FRIEDRICH SOLMSEN.

*The courses listed here are interdepartmental courses in literature which will be of interest to students in any of the various national literatures. Included here also are courses in foreign literatures in translation intended primarily for those who are not doing special work in that particular foreign literature.*

*For a major in Literature one of the following alternatives must be chosen: Alternative A (1) advanced courses in one national literature, observing approximately the departmental rules for a major (twenty-four hours); (2) in divisional courses (twelve hours); (3) in related subjects: European or appropriate national history (six hours), History of Philosophy or of philosophical ideas (six hours), Latin and Greek classics, whether in translation or in the original (six hours). Alternative B (1) advanced courses in one national literature (eighteen hours); (2) in a second literature (Greek 101–203 inclusive acceptable) (twelve hours); (3) in divisional courses (twelve hours); (4) in related subjects, two of the three groups as stated under Alternative A (3).*

*For listings of other courses in literature see the following: Classics, English, Far Eastern Studies, French, German, Italian, Russian, Spanish, and Speech and Drama.*

**\*101–102 INTRODUCTION TO LITERATURE.** Throughout the year. Credit three hours a term. First term prerequisite to the second. For freshmen and sophomores. M W F 9, 10, 12 or 2; T Th S 9, 10; (The M W F 2 section open only to those who have taken or are taking History 103–104). Mr. LANGE and others.

A study of narrative prose, drama, and poetry selected from the literature of the world. The purpose of the course is to quicken appreciation of literary values by the analysis of the content and form of masterpieces.

Course 101 will also be offered in the spring term but only for freshmen exempted from English 112. No others will be admitted. Hours for 101, spring term, M W F 12, T Th S 10. Course 102 will be offered M W F 12 in the fall term but only for those students who had 101 in the spring term of 1951.

**201–202. ENGLISH TRANSLATIONS OF GREEK AND LATIN CLASSICS.** Throughout the year. Credit three hours a term. First term prerequisite to the second. Open to sophomores and upperclassmen. T 2–4 or Th 2–4, and an hour to be arranged. Fall term, Mr. HUTTON. Spring term, Mr. CAPLAN.

Rapid reading in the best translations with emphasis upon Greek masterpieces; for example, the *Iliad* and the *Odyssey*, the tragedies of Sophocles, and several dialogues of Plato. Translations from the Latin will be chosen for the bearing of the original works upon modern literature.

**207. FOUNDATIONS OF WESTERN THOUGHT.** Fall term. Credit three hours. Open to sophomores and upperclassmen. M W F 10. Mr. SOLMSEN.

A study of the beliefs and ideas — religious, moral, social, and scientific — which were current or advanced in the Greek, Roman, and Early Christian period of Western civilization; the history and transformation of these ideas and their integration into coherent bodies of thought. Popular thought and practices as well as the ideas of leading thinkers and poets will be considered. Reading of representative material in translation. Two hours will be given to lectures, one hour to discus-

sion of the ideas treated; attention will be given to their influence on later thought and their relevance to present-day problems.

[211-212. *SURVEY OF MEDIEVAL LITERATURE*. Throughout the year. Credit three hours a term. First term prerequisite to the second. Mr. JONES. Not given in 1951-52.]

[214. *HUMANISM AND THE RENAISSANCE*. Spring term. Credit three hours. Primarily for upperclassmen. Mr. HUTTON. Not given 1951-52.]

301-302. *DRAMA AND THE THEATRE*. Throughout the year. Credit three hours a term. M W F 11. Messrs. MYERS and ALBRIGHT. Students with specialized interests in Drama or the Theatre should elect this course early in their programs, preferably in the sophomore year.

An introduction to representative types and forms of drama as interpreted in the theatre, designed to increase appreciation of the drama as literature and of the theatre as art form and social institution. The development of dramatic literature, the distinguishing qualities of its chief types (tragedy, comedy, melodrama, farce), and the basic principles of dramaturgy will be illustrated by ancient and modern plays. This survey will be paralleled by tracing the development of the physical stage and of the changing theories and techniques of theatrical production in the important stylistic periods from the Greeks to the present.

*MASTERS OF GERMAN LITERATURE*. (See German 301-302.)

311-312. *EUROPEAN FICTION*. Throughout the year. Credit three hours a term. M W F 12. Mr. NABOKOV.

Selected English, Russian, French, and German novels and short stories of the nineteenth and twentieth centuries will be read. Special attention will be paid to individual genius and questions of structure. All foreign novels will be read in English translation.

321. *CHINESE LITERATURE IN TRANSLATION*.

Fall term: philosophical and historical literature, including Confucian, Taoist, and Buddhist writings. Credit three hours a term. M W F 10. Mr. SHADICK.

322. *CHINESE LITERATURE IN TRANSLATION*.

Spring term: imaginative literature, including poetry, classical prose, fiction, drama, and the new writing of the twentieth century. Credit three hours a term. M W F 10. Mr. SHADICK.

401-402. *PRINCIPLES OF LITERARY CRITICISM*. Throughout the year. Credit three hours a term. Fall term, M 2-4 or W 2-4, Mr. CAPLAN. Spring term, M W F 2, Mr. —.

Theories of literary art. In the fall term, consideration will be given to Greek and Roman criticism; in the spring term, to criticism from the Renaissance to the present day.

[421. *MODERN LITERARY CRITICISM*. Spring term. Credit three hours. Prerequisite, consent of the instructor. M W F 12. Mr. SALE. Not given 1951-52.]

## MATHEMATICS

Mr. R. J. WALKER, *Chairman*; Mr. AGNEW, Mrs. AYOUB, Messrs. FUCHS, HUNT, HURWITZ, KAC, OLUM, POLLARD, ROSSER, SHAPIRO, YOOD.

*For a major in Mathematics, the following courses must be completed: (1) in Mathematics, at least fifteen hours of courses numbered above 200, including at least one of the following full-year courses, 371-372, 401-402, 501-502; (2) in related subjects, at least fifteen hours to be selected from approved courses in Astronomy, Chemistry, Economics, Education, French, Geology, German, Italian, Philosophy, Physics, and Russian.*

*Students planning to teach mathematics in secondary schools should make themselves familiar with the New York State requirements. They should bear in mind that the teaching of mathematics is frequently combined with teaching of physical science or general science. The Department of Mathematics recommends, as minimum preparation for teaching the subject, Mathematics 171, 172, and six additional hours selected from the following list: Mathematics 173, 201, 241, 242, 341, 401, 501. Students planning to teach primarily mathematics should meet the requirements for a major in the subject.*

*Students wishing to take any of the courses numbered above 173 are invited to confer, before registering, with the instructor concerned.*

*Of courses 121 to 173, not more than six hours may be taken simultaneously without the special permission of the Department.*

**\*121-122. SELECTED TOPICS IN MATHEMATICS.** Throughout the year. Credit three hours a term. Prerequisites, Plane Geometry and Intermediate Algebra. First term prerequisite to the second. T Th S 11.

This course is intended for students who do not plan to take many courses in mathematics, but who nevertheless wish to become acquainted with the principal ideas of modern mathematics. The object will be to make clear the fundamental aims, methods, and results of a number of subjects, rather than to develop the technique of any one subject. Although this course is not designed to satisfy prerequisites for courses in Analytic Geometry and Calculus, a student who has passed it with a sufficiently high grade may be admitted to such courses. The course will not serve the purpose of a review course to improve faulty preparation in elementary mathematics.

**\*133. PLANE TRIGONOMETRY.** Either term. Credit three hours except for students offering Trigonometry for entrance. Prerequisites, Plane Geometry and Intermediate Algebra. M W F 10 or T Th S 9.

**\*153-154. MATHEMATICS FOR SOCIAL AND BIOLOGICAL SCIENCES.** Throughout the year. Credit three hours a term. Prerequisites, Plane Geometry and Intermediate Algebra. First term prerequisite to second. T Th S 10.

Covers those parts of analytic geometry and calculus which are of greatest importance in statistics and various applications in economics, sociology, psychology, biology, etc. Emphasis is on conceptual understanding. This course is not intended to satisfy prerequisites for courses in Mathematics, Physics, Chemistry, Architecture, or Engineering. Mathematics 154 will serve as prerequisite for Mathematics 711.

**\*161, 162, 163. ANALYTIC GEOMETRY AND CALCULUS.** Three terms; each course is offered each term. Credit three hours a term. Prerequisites, Trigonometry



and Intermediate Algebra. Course 161 is prerequisite to 162. Course 162 is prerequisite to 163. Lectures. Fall term: 161, T Th 8, 10, or 12; 162, M W 8; 163, M W 8, 10, or 12. Spring term: 161, M W 8; 162, T Th 8, 10, or 12; 163, M W 8. One recitation a week to be arranged.

Primarily for students in the College of Engineering. Students taking Physics 107 who have not had analytic geometry or calculus should take Mathematics 161 concurrently with Physics 107.

\*171. *ANALYTIC GEOMETRY*. Either term. Credit three hours. Prerequisites, Trigonometry and Intermediate Algebra. Lectures: fall term, M W 10 or T Th 11; spring term, Th S 8. One recitation a week to be arranged.

Coordinate geometry of two and three dimensions. The subject is presented as an integrated mathematical discipline, not merely as a tool to be used in conjunction with calculus.

\*172. *CALCULUS*. Either term. Credit three hours. Prerequisite, Mathematics 171. Lectures: fall term, Th S 8; spring term, M W 10 or T Th 11. One recitation a week to be arranged.

Elements of differential and integral calculus with applications to problems in geometry and the physical, biological, and social sciences. Differentiation of algebraic and transcendental functions; integration of polynomials.

\*173. *CALCULUS*. Either term. Credit three hours. Prerequisite, Mathematics 172. Lectures: fall term, M W 9; spring term, Th S 8. One recitation a week to be arranged.

Additional work with indefinite and definite integrals, infinite series, partial derivatives, multiple integrals.

201. *ELEMENTARY DIFFERENTIAL EQUATIONS*. Either term. Credit three hours. Prerequisite, Mathematics 163 or 173. Fall term, M W F 10, T Th S 9; spring term M W F 11, T Th S 9.

Solution of ordinary differential equations by analytic and numerical methods.

241-242. *SURVEY OF MATHEMATICS*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 172 or consent of the teacher. First term prerequisite to second. T Th S 10. Mrs. AYOUB.

Primarily for undergraduates. Review of elementary mathematics from a more advanced viewpoint. Introduction to the general character of higher mathematics. Particularly intended for prospective teachers and those with a cultural interest in mathematics.

323. *THEORY OF GROUPS*. Spring term. Credit three hours. Prerequisite, Mathematics 172. T Th S 9. Mr. HURWITZ.

Primarily for undergraduates. The general properties of abstract groups, with applications to various branches of mathematics; the specific properties of permutation groups and other finite groups; the Sylow theorems; fields as related to groups.

341. *THEORY OF NUMBERS*. Fall term. Credit three hours. Prerequisite, Mathematics 172. T Th S 9. Mr. HURWITZ.

Primarily for undergraduates. The elementary theory of real rational integers. Divisibility; primality; congruences; primitive roots; Diophantine problems.

371-372. *MODERN ALGEBRA*. Throughout the year. Credit three hours a term.

Prerequisite, Mathematics 173. First term prerequisite to second. T Th S 9. Mrs. AYOUB.

For graduate students and qualified undergraduates. An introductory course in modern algebra, serving as a basis for further work in algebra and geometry.

401-402. *PROJECTIVE GEOMETRY*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 172. First term prerequisite to second. M W F 9.

Primarily for undergraduates. A first course in projective geometry, including both synthetic and analytic methods.

413. *POINT SET TOPOLOGY*. Spring term. Credit three hours. Prerequisite, Mathematics 505 or the equivalent. M W F 11. Mr. SHAPIRO.

For graduate students and qualified undergraduates. A systematic development of the topological concepts used in modern analysis and geometry.

453. *ALGEBRAIC GEOMETRY*. Spring term. Credit three hours. Prerequisite, Mathematics 173. Hours to be arranged. Mr. WALKER.

Primarily for undergraduates. An introduction to the simpler properties of plane algebraic curves. Some of the topics to be discussed are homogeneous coordinates, singularities and inflections of curves, and quadratic transformations.

501-502. *ADVANCED CALCULUS*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 173. First term prerequisite to second. M W F 11. Mr. AGNEW.

For graduate students and qualified undergraduates. A careful study of limits, continuity, derivatives, and Riemann integrals. Functions of several variables. Multiple and line integrals. The course is designed to furnish necessary preparation for advanced work in analysis and applied mathematics. Emphasis is placed on the logical development of the calculus, rather than on a wide range of formal applications.

505. *FOUNDATIONS OF ANALYSIS*. Fall term. Credit three hours. Prerequisite, Mathematics 501 or the equivalent. M W F 11. Mr. SHAPIRO.

For graduate students and qualified undergraduates. A study of the elementary set-theoretic, algebraic, and topological notions necessary for the development of the real numbers and the function spaces of analysis.

507. *HILBERT SPACE*. Spring term. Credit three hours. Prerequisite, Mathematics 505 or the equivalent. T Th 2:00-3:15.

For graduate students and qualified undergraduates. Linear transformations in Hilbert space. Symmetric, self-adjoint, unitary, normal operators, etc. Resolutions of the identity. An introduction to the theory of rings of operators.

515-516. *FUNCTIONAL ANALYSIS*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 512. Mr. YOOD. Hours to be arranged.

Banach spaces, Banach algebras and related topics in the theory of abstract spaces. Applications to problems in analysis are considered.

531-532. *COMPLEX VARIABLES*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 502 or 612. M W F 10. Mr. FUCHS.

For graduate students and qualified undergraduates. Complex number system; the elementary functions, complex differentiation, and integration; Cauchy's theorem; Taylor's series; singularities; conformal mapping; Riemann surfaces; Fourier and Laplace transformations; differential and integral equations. Applications.

537-538. *FOURIER ANALYSIS*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 512. First term prerequisite to second. T Th 2:00-3:15. Mr. HUNT.

For graduate students and qualified undergraduates. Convergence and summability of Fourier series and integrals, distributions and positive definite functions, absolute convergence of Fourier transforms. Tauberian theorems, Hilbert transforms, some applications to differential and integral equations.

543. *ANALYTIC THEORY OF NUMBERS*. Fall term. Credit three hours. Prerequisite, Mathematics 531. M W F 10. Mr. ROSSER.

For graduate students and qualified undergraduates. Topics will be selected from the following: prime number theorem, primes in arithmetic sequences, partitions, lattice-point problem, three prime theorem. No particular knowledge of number theory is required.

605. *NUMERICAL AND GRAPHICAL METHODS*. Spring term. Credit three hours. Prerequisite, Mathematics 201. M W F 10. Mr. ROSSER.

Primarily for undergraduates. Processes useful in solving problems of engineering, physics, chemistry, etc. Nomograms, interpolation, numerical integration, Fourier series, numerical solution of algebraic, transcendental, and ordinary and partial differential equations.

607. *APPLIED MATHEMATICS FOR ELECTRICAL ENGINEERS*. Spring term. Credit three hours. Prerequisite, Mathematics 163. Times to be announced.

Complex numbers, determinants, Fourier series, solution of algebraic and transcendental equations, vector algebra, theory of errors, and dimensional analysis.

611-612. *HIGHER CALCULUS*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 201. First term prerequisite to second. T Th S 10.

Primarily for undergraduates. Partial differentiation, multiple and line integrals, Fourier series, partial differential equations, vector analysis, complex variables, calculus of variations, Laplace transforms. Emphasis is placed on a wide range of formal applications of the calculus, rather than on the logical development. The second term will be accepted as prerequisite to Complex Variables.

621-622. *MATHEMATICAL METHODS IN PHYSICS*. Throughout the year. Credit five hours a term. Prerequisites, Mathematics 201 and at least two years of general physics. First term prerequisite to second. M T W Th F 12. Mr. OLUM.

For graduate students and qualified undergraduates. Lectures and problem work designed to give the students a working knowledge of the principal mathematical methods used in advanced physics.

641-642. *PARTIAL DIFFERENTIAL EQUATIONS*. Throughout the year. Credit three hours a term. Prerequisite, Mathematics 612. First term prerequisite to second. M W F 9.

For graduate students and qualified undergraduates. A survey of differential equations arising in engineering and physics, and mathematical devices required for their solution. Emphasis is on a wide range of application rather than a rigorous development.

711-712. *ELEMENTARY MATHEMATICAL STATISTICS*. Throughout the year.

Credit three hours a term. Prerequisite, Mathematics 154 or 173. First term prerequisite to second. T Th S 11.

Primarily for undergraduates. An introduction to the elements of theoretical statistics, in particular to statistical inference.

#### *READING, RESEARCH, and INFORMAL STUDY*

For properly qualified students, members of the Department will direct reading and research not necessarily associated with any course.

031. *READING IN ALGEBRA.*

041. *READING IN GEOMETRY.*

051. *READING IN ANALYSIS.*

061. *READING IN APPLIED MATHEMATICS.*

071. *READING IN PROBABILITY AND STATISTICS.*

### MODERN FOREIGN LANGUAGES AND LITERATURES

Courses in Modern Foreign Languages and Literatures are offered by the following divisions of the College:

Department of German Literature, Mr. VICTOR LANGE, chairman

Division of Modern Languages, Mr. J M. COWAN, chairman

Department of Romance Literature, Mr. MORRIS BISHOP, Chairman

#### CHINESE

Messrs. C. F. HOCKETT, H. E. SHADICK, and STAFF.

(For a major involving Chinese studies, see Department of Far Eastern Studies.)

\*101-102. *ELEMENTARY COLLOQUIAL CHINESE.* Throughout the year. Credit six hours a term. T Th 9 and M T W Th F S 8.

\*103. *ELEMENTARY COLLOQUIAL CHINESE.* Either term. Credit three hours. Open only to students with credit for Chinese 102 who have failed the Proficiency Examination. Hours to be arranged.

\*201. *INTRODUCTION TO LITERARY CHINESE.* Fall term. Credit three hours. Prerequisite, a satisfactory Proficiency Examination or Chinese 103. M W F 11. Mr. SHADICK.

\*203. *INTERMEDIATE COLLOQUIAL CHINESE.* Fall term. Credit four hours. Prerequisite, a satisfactory Proficiency Examination or Chinese 103. T Th S 11 and two laboratory hours to be arranged. Mr. HOCKETT.

212. *INTERMEDIATE LITERARY CHINESE.* Spring term. Credit three hours. Prerequisite, Chinese 201. M W F 11. Mr. SHADICK.

214. *INTERMEDIATE COLLOQUIAL CHINESE.* Spring term. Credit four hours. Prerequisite, Chinese 203. T Th S 11 and two laboratory hours to be arranged. Mr. HOCKETT.

232. *THE LINGUISTIC STRUCTURE OF CHINESE*. Spring term. Credit three hours. Prerequisite, proficiency in Chinese or Linguistics 201. Offered in 1951-52 and alternate years. Hours to be arranged. Mr. HOCKETT.

The placement of Peiping Chinese among modern Chinese dialects; a study of the sounds, forms, and structure of Peiping Chinese; nature of the Chinese writing system in relation to the language; sociological and psychological aspects of Chinese linguistic structure. Lectures, discussion, and exercises.

## ENGLISH FOR FOREIGNERS

*The following two courses are offered by the Division of Modern Languages. Foreign students should consult a member of that division at Morrill Hall 108.*

\*102. *ENGLISH FOR FOREIGNERS*. Fall term. Credit six hours. Prerequisite, placement by the instructor. Hours to be arranged.

\*211. *ENGLISH FOR FOREIGNERS*. Fall term. Credit six hours. Prerequisite, a satisfactory Proficiency Examination. Hours to be arranged.

## FRENCH

Messrs. MORRIS BISHOP, JEAN COLLIGNON, J. R. FRITH, R. A. HALL, JR., B. L. RIDEOUT, and STAFF.

*Courses numbered below 300 are offered by the Division of Modern Languages and those numbered 300 and higher are offered by the Department of Romance Literature. All courses above 199 presuppose proficiency in French.*

*Students desiring to major in French may choose between two programs: (1) French Literature; (2) French Linguistics.*

*For a major in French Literature, consult Mr. BISHOP. The student must complete (1) eighteen hours of courses numbered from 301 to 399; (2) twelve hours of courses in a second literature (except that English 111-112 may not be counted); (3) in related subjects, eighteen hours to be selected from Languages and Literatures, European History, Fine Arts, Music History, History of Philosophy, and Dramatic Production; except that the twelve hours of courses specified under (2) may not be counted as a related subject.*

*For a major in French Linguistics, consult Mr. HALL. The following courses must be completed: (1) Linguistics 201-202; (2) French 214, 232, 233, 241, 242; (3) French Literature 301-302; (4) at least twelve hours in related subjects.*

\*101. *ELEMENTARY COURSE*. Either term. Credit six hours. Students who have previously studied any French must take the Proficiency Examination before registering for this course. Hours as assigned.

\*102. *ELEMENTARY COURSE*. Either term. Credit six hours. Prerequisite, French 101 or its equivalent. Students who have not completed French 101 (except those currently enrolled in French 101) must take the Proficiency Examination before registering for this course. Hours as assigned.

\*103. *ELEMENTARY COURSE*. Either term. Credit three hours. Open only to students with credit for French 102 who have failed the Proficiency Examination. M W F 2. T Th S 2.



\*201 *INTERMEDIATE READING COURSE*. Either term. Credit three hours. Prerequisite, a satisfactory Proficiency Examination, or French 103. M W F 10, T Th S 10.

\*203. *INTERMEDIATE COMPOSITION AND CONVERSATION*. Either term. Credit three hours. Prerequisite, a satisfactory Proficiency Examination or French 103. M W F 12 or 2, T Th S 9.

214. *INTERMEDIATE COMPOSITION AND CONVERSATION*. Either term. Credit three hours. Prerequisite, French 203. M W F 9.

223. *ADVANCED COMPOSITION AND CONVERSATION*. Fall term. Credit three hours. Prerequisite, French 214. Hours to be arranged.

224. *ADVANCED COMPOSITION AND CONVERSATION*. Spring term. Credit three hours. Prerequisite, French 214. Hours to be arranged.

232. *THE LINGUISTIC STRUCTURE OF FRENCH*. Spring term. Given in 1952 and alternate years. Credit three hours. Prerequisite, proficiency in French and Linguistics 201. M W F 2. Mr. HALL.

Descriptive study and analysis of French linguistic structure. French phonetics and phonemics: the sounds of French with special attention to contrast with English sounds; syllable-structure; stress and intonation. The forms and sequences of forms of the language, studied from the point of view of speech and of its written representation. The results of linguistic analysis contrasted with traditional grammatical description. Lectures, discussion, and exercises.

233. *OLD FRENCH TEXTS*. Fall term. Given in 1951 and alternate years. Prerequisite, proficiency in French. M W F 2. Mr. HALL.

[241-242. *HISTORY OF THE FRENCH LANGUAGE*. Throughout the year. Credit three hours a term. Prerequisite, proficiency in French. M W F 2. Mr. HALL. Offered in alternate years. Not offered in 1951-52.]

\*301-302. *SURVEY OF FRENCH LITERATURE*. Throughout the year. Credit three hours a term. Prerequisite, French 201, or four years of entrance French, or consent of the instructor. The course may be entered in the second term. M W F 11. Mr. BISHOP or Mr. COLLIGNON.

Lectures in French and classroom discussions on French literature from the medieval period to the present day. Freshmen who have learned to read, understand, and speak French with reasonable readiness should find the course within their grasp.

311-312. *LITERATURE OF THE SIXTEENTH CENTURY*. Throughout the year. Credit two hours a term. Prerequisite, French 301 or the consent of the instructor. The course may be entered in the second term. T Th 12. Mr. COLLIGNON.

Lectures in French and classroom discussions, with special emphasis on the ideas and literary principles of the Renaissance.

[313-314. *LITERATURE OF THE SEVENTEENTH CENTURY*. Not offered in 1951-52.]

[315-316. *LITERATURE OF THE EIGHTEENTH CENTURY*. Not offered in 1951-52.]

317-318. *LITERATURE OF THE EARLY NINETEENTH CENTURY*. Throughout the year. Credit three hours a term. Prerequisite, French 302 or the consent of

the instructor. The course may be entered in the second term. M W F 9. Mr. RIDEOUT.

Lectures in French and classroom discussions. The central theme of the course is Romanticism, its theory and achievement.

[319-320. *LITERATURE OF THE LATE NINETEENTH CENTURY*. Not offered in 1951-52.]

[321-322. *LITERATURE OF THE TWENTIETH CENTURY*. Not offered in 1951-52.]

[351. *FRENCH FOR TEACHERS*. Not offered in 1951-52.]

[361-362. *FRENCH CULTURE AND CIVILIZATION*. Not offered in 1951-52.]

375-376. *MODERN FRENCH SEMINAR*. Throughout the year. Credit two hours a term. Hours to be arranged. Mr. BISHOP or Mr. COLLIGNON.

An introduction to the methods and materials of research in French literature, by means of a collective study of a problem in French literary history.

010. *INFORMAL STUDY*. Open to qualified juniors and seniors by arrangement.

## GERMAN

Messrs. J M. COWAN, E. KAHLER, V. LANGE, W. G. MOULTON, R. NOTHMAN, W. F. OECHLER, and STAFF.

*Courses numbered below 300 are offered by the Division of Modern Languages. Those numbered 300 and higher are offered by the Department of German Literature. All courses above 199 except 301-302, 303 presuppose proficiency in German.*

*Students desiring to major in German may choose among three programs of study: (1) German Literature; (2) German Linguistics; (3) German Studies.*

*For a major in German Literature consult Mr. LANGE. The following courses must be completed: (1) at least twenty-one hours of advanced courses in German Literature, including 305-306, 332, and 365-366; (2) in related subjects, at least fifteen hours selected from the Division of Literature, the Division of Modern Languages, the Classics, Ancient and European History, Philosophy. The student should consult his adviser for the planning of a coherent program.*

*For a major in German Linguistics consult Mr. MOULTON. The following courses must be completed: (1) Linguistics 201-202; (2) German 202, 204, 232, 241, 242; (3) German 305-306 and six additional hours in German Literature; (4) at least six hours in related subjects.*

*For a major in German Studies consult Mr. LANGE. The following courses must be completed: (1) German 241; (2) German 303, 305-306, 332, 365-366; (3) in related subjects, History 423, 426; Government 104; (4) at least twelve hours selected from the following: German 204, 232; Literature 207; Philosophy 579, 580; Government 411; Sociology 611.*

\*101. *ELEMENTARY COURSE*. Either term. Credit six hours. Students who have previously studied any German must take the proficiency examination before registering for this course. Hours as assigned.

\*102. *ELEMENTARY COURSE*. Either term. Credit six hours. Prerequisite, German 101 or its equivalent. Students who have not completed German 101 (except those currently enrolled in German 101) must take the proficiency examination before registering for this course. Hours as assigned.

\*103. *ELEMENTARY COURSE*. Either term. Credit three hours. Open only to students with credit for German 102 who have failed the proficiency examination. M W F 11.

\*105. *SCIENTIFIC READING*. Spring term. Credit three hours. Prerequisite, German 102, or proficiency in German. M W F 9. Mr. COWAN.

\*201-202. *GERMAN READING*. Throughout the year. Credit three hours a term. Prerequisite for 201, proficiency in German; for 202, course 201 or consent of the instructor. Either term may be taken separately. M W F 10. Fall term, Mr. LANGE; spring term, Mr. OECHLER.

\*203-204. *COMPOSITION AND CONVERSATION*. Throughout the year. Credit three hours a term. Prerequisite, proficiency in German. Course 203 is prerequisite to 204. T Th S 9. Mr. NOTHMAN.

[232. *LINGUISTIC STRUCTURE OF GERMAN*. Spring term 1953 and alternate years. Credit three hours. Prerequisites, proficiency in German and Linguistics 201. T Th S 10. Mr. MOULTON. Not given in 1951-52.]

241. *HISTORY OF THE GERMAN LANGUAGE*. Fall term 1951 and alternate years. Credit three hours. Prerequisite, proficiency in German. T Th S 10. Mr. MOULTON.

The relationship of German to other Germanic and Indo-European languages. The development of High German from the earliest texts to modern times. The rise of the standard language; dialects. Analysis of changes in sounds and forms. Lectures, discussion, reading, and analysis of texts.

242. *MIDDLE HIGH GERMAN*. Spring term 1952 and alternate years. Credit three hours. Prerequisite, German 241 or 281-282. T Th S 10. Mr. MOULTON.

Reading, discussion, and analysis of the language in Middle High German texts.

[281-282. *GOTHIC AND COMPARATIVE GERMANIC LINGUISTICS*. Throughout the year 1952-53 and alternate years. Credit three hours a term. Mr. MOULTON. Not given in 1951-52.]

\*301-302. *MASTERS OF GERMAN LITERATURE*. Throughout the year. Credit three hours a term. Open to all students. A knowledge of German is not required. Lectures and reading in English. M W F 12. Mr. LANGE.

A survey of German letters in relation to European thought. The course stresses the works of German novelists, poets, and dramatists as well as those historians and philosophers who have contributed to the intellectual history of Europe and to the contemporary value system. The first term will deal with the period before 1870, the second with the contemporary scene and such writers as Thomas Mann, Kafka, and Rilke. Either term may be taken independently of the other.

303. *INTELLECTUAL EVOLUTION OF MODERN GERMANY*. Fall term. Credit three hours. M W F 12. Mr. KAHLER.

The course will deal with the main currents of German thought and feeling. Lectures and reading in English. A knowledge of German is not required.

305-306. *SURVEY OF GERMAN LITERATURE*. Throughout the year. Credit three hours a term. M W F 11. Mr. OECHLER.

A survey of the development of German literature from the origins to the end of the nineteenth century. Representative works will be read in German. Lectures and supplementary reading in German and English.

[309. *MIDDLE HIGH GERMAN LITERATURE*. Fall term. Credit three hours. Hours to be arranged. Mr. OECHLER. Not given in 1951-52.]

Reading and discussion of the German heroic, popular, and court epics as well as the Minnesang of the chivalric age. A knowledge of Middle High German is required.

310. *GERMAN REFORMATION AND BAROQUE*. Fall term. Credit three hours. Hours to be arranged. Mr. OECHLER.

[315. *GERMAN POETRY FROM GOETHE TO THE PRESENT*. Spring term. Credit three hours. Mr. LANGE. Not given in 1951-52.]

[316. *GERMAN PROSE FICTION FROM GOETHE TO THOMAS MANN*. Fall term. Credit three hours. M W F 9. Mr. LANGE. Not given in 1951-52.]

An introduction to the history of the German novel and short story from the end of the eighteenth century to the present. Representative works will be read in German or English.

[325. *THE GERMAN DRAMA OF THE NINETEENTH CENTURY*. Spring term. Credit three hours. Hours to be arranged. Mr. OECHLER. Not given in 1951-52.]

Reading and discussion of select plays by Kleist, Grillparzer, Büchner, Grabbe, Hebbel, and Hauptmann.

332. *MODERN GERMAN LITERATURE 1870-1940*. Fall term. Credit three hours. M W F 2. Mr. KAHLER.

345. *LESSING AND THE PERIOD OF ENLIGHTENMENT*. Spring term. Credit three hours. Hours to be arranged. Mr. OECHLER.

[350. *SCHILLER*. Fall term. Credit three hours. M W F 2. Mr. KAHLER. Given in alternate years. Not given in 1951-52.]

365-366. *GOETHE*. Throughout the year. Credit three hours a term. M W F 9. Mr. LANGE. Given in alternate years. German 366 will not be given in spring, 1952. Students are referred to German 476.

[420. *GERMAN ROMANTICISM*. Spring term. Credit three hours. M W F 12. The STAFF. Not given in 1951-52.]

[470. *PROSEMINAR IN GERMAN LITERATURE*. Spring term. Introduction to historical and critical methods. Credit two hours. One meeting a week at a time to be arranged. Mr. LANGE. Given in alternate years. Not given in 1951-52.]

475-476. *SEMINAR IN GERMAN LITERATURE*. Throughout the year. Credit three hours a term. One meeting a week at a time to be arranged. Fall term: Rilke; Mr. KAHLER. Spring term: Goethe's *Faust*; Mr. LANGE.

080. *INFORMAL STUDY*. Open to qualified juniors and seniors. Mr. OECHLER.

090. *INFORMAL STUDY*. Open to qualified juniors and seniors. Mr. LANGE.

## ITALIAN

Messrs. MORRIS BISHOP, R. A. HALL, JR., and STAFF.

*For a major in Italian Literature, consult Mr. BISHOP. The student must complete (1) eighteen hours of courses numbered from 301 to 399; (2) twelve hours of courses in a second literature (except that English 111-112 may not be counted); (3) in related subjects, eighteen hours to be selected from Languages and Literatures, European History, Fine Arts, Music History, History of Philosophy, and Dramatic Production; except that the twelve hours of courses specified under (2) may not be counted as a related subject.*

\*101. *ELEMENTARY COURSE*. Fall term. Credit six hours. T Th 10 and M T W Th F S 9 or 11.

\*102. *ELEMENTARY COURSE*. Spring term. Credit six hours. Prerequisite, Italian 101. T Th 10 and M T W Th F S 9 or 11.

\*103. *ELEMENTARY COURSE*. Either term. Credit three hours. Open only to students with credit for Italian 102 who have failed the Proficiency Examination. Hours to be arranged.

\*201. *INTERMEDIATE READING COURSE*. Fall term. Credit three hours. Prerequisite, a satisfactory Proficiency Examination or Italian 103. Hours to be arranged.

\*203. *INTERMEDIATE COMPOSITION AND CONVERSATION*. Fall term. Credit three hours. Prerequisite, a satisfactory Proficiency Examination or Italian 103. Hours to be arranged.

214. *INTERMEDIATE COMPOSITION AND CONVERSATION*. Spring term. Credit three hours. Prerequisite, Italian 203. Hours to be arranged.

224. *ADVANCED COMPOSITION AND CONVERSATION*. Given as required. Credit two to four hours. Prerequisite, Italian 214. Hours to be arranged.

[301-302. *DANTE*. Not offered in 1951-52.]

307-308. *SURVEY OF ITALIAN LITERATURE*. Throughout the year. Credit three hours a term. Prerequisite, proficiency in Italian. Hours to be arranged. Mr. HALL.

A study of the characteristic works of Italian writers from Petrarch to modern times. The course is open to qualified freshmen.

[315-316. *LITERATURE OF THE TWENTIETH CENTURY*. Not offered in 1951-52.]

010. *INFORMAL STUDY*. Open to qualified juniors and seniors by arrangement.

## LINGUISTICS

Messrs. F. B. AGARD, J. M. COWAN, G. H. FAIRBANKS, R. A. HALL, JR., C. F. HOCKETT, W. G. MOULTON.

201-202. *INTRODUCTION TO THE SCIENTIFIC STUDY OF LANGUAGE*. Throughout the year. Credit three hours a term. M W F 9. Mr. HALL.



A basic introductory course designed to acquaint the student with the methods of systematic observation of language phenomena (linguistics). This course is required for all majors in French, German, Spanish, or Russian Linguistics; it is also a prerequisite, or a concurrent requirement, for Linguistic Analysis 203-204.

203-204. *LINGUISTIC ANALYSIS*. Throughout the year. Credit three hours a term. Prerequisite, Linguistics 201. M W F 10. Mr. HOCKETT.

A training course in the techniques of observation and analysis of descriptive linguistics. Fall term: phonetics and phonemics. Spring term: morphology and syntax.

[205. *FIELD METHODS*. Fall term. Credit three hours. Prerequisite, Linguistics 204. Hours to be arranged; four class or laboratory hours a week may be required. Mr. HOCKETT. Not offered in 1951-52.]

211-212. *ACOUSTICAL PHONETICS*. Throughout the year. Credit three hours a term. Prerequisite: consent of the instructor. Hours to be arranged. Mr. COWAN.

A rapid survey of the techniques of experimental articulatory phonetics; the speech mechanism as a sound generator; sound recording techniques, and the methods of general acoustics; application of acoustical analysis to the study of speech sounds. The course will require no mathematical training of the students beyond arithmetical computation; the necessary mathematical operations for acoustical analysis will be developed for the students by the instructor.

281-282. *THE COMPARATIVE STUDY OF ROMANCE LANGUAGES*. Throughout the year. Credit three hours a term. Prerequisite: Linguistics 201-202, taken previously or concurrently. Hours to be arranged, Mr. HALL.

The family of Romance Languages; the application of the comparative method and the reconstruction of Proto-Romance speech. The relation between Proto-Romance and Old and Classical Latin. The history of the Romance Languages as a whole from Latin times to the present, and their interrelationships. A survey of the accomplishments and approaches of recent work in Romance linguistics. Lectures, discussion, and exercises.

## PORTUGUESE

Mr. F. B. AGARD and STAFF.

\*101. *ELEMENTARY COURSE IN BRAZILIAN PORTUGUESE*. Fall term. Credit six hours. T Th 11 and M T W Th F S 12.

\*102. *ELEMENTARY COURSE IN BRAZILIAN PORTUGUESE*. Spring term. Credit six hours. Prerequisite, Portuguese 101. T Th 11 and M T W Th F S 12.

\*103. *ELEMENTARY COURSE IN BRAZILIAN PORTUGUESE*. Spring term. Credit three hours. Open only to students with credit for Portuguese 102 who have failed the Proficiency Examination. Hours to be arranged.

\*201. *INTERMEDIATE READING COURSE*. Spring term. Credit three hours. Prerequisite, a satisfactory Proficiency Examination or Portuguese 103. Hours to be arranged.

\*203. *INTERMEDIATE COMPOSITION AND CONVERSATION*. Fall term. Credit three hours. Prerequisite, a satisfactory Proficiency Examination or Portuguese 103. Hours to be arranged.

## RUSSIAN

Messrs. G. H. FAIRBANKS, V. NABOKOV, and STAFF.

*For a major in Russian Linguistics, consult Mr. FAIRBANKS. The following courses must be completed: (1) Linguistics 201-202; (2) Russian 201, 203, 212, 214, 232, 241; (3) Russian 301-302; (4) at least twelve hours in related subjects.*

\*101. *ELEMENTARY COURSE*. Fall term. Credit six hours. Hours as assigned.

\*102. *ELEMENTARY COURSE*. Spring term. Credit six hours. Prerequisite, Russian 101. Hours as assigned.

\*103. *ELEMENTARY COURSE*. Either term. Credit three hours. Open only to students with credit for Russian 102 who have failed the Proficiency Examination. Hours to be arranged.

\*201. *INTERMEDIATE READING COURSE*. Fall term. Credit three hours. Prerequisite, a satisfactory Proficiency Examination or Russian 103. M W F 10.

\*203. *INTERMEDIATE COMPOSITION AND CONVERSATION*. Fall term. Credit three hours. Prerequisite, Russian 201 or concurrent registration in Russian 201. T Th S 11 and two hours to be arranged.

212. *INTERMEDIATE READING COURSE*. Spring term. Credit three hours. Prerequisite, Russian 201. M W F 11.

214. *INTERMEDIATE COMPOSITION AND CONVERSATION*. Spring term. Credit three hours. Prerequisite, Russian 212 or concurrent registration in Russian 212. T Th S 11 and two hours to be arranged.

223. *ADVANCED COMPOSITION AND CONVERSATION*. Fall term. Credit three hours. Prerequisite, Russian 214. Hours to be arranged.

224. *ADVANCED COMPOSITION AND CONVERSATION*. Spring term. Credit three hours. Prerequisite, Russian 223. Hours to be arranged.

225. *ADVANCED READING*. Either term. Credit three hours. Prerequisite, Russian 212. Hours to be arranged.

232. *THE LINGUISTIC STRUCTURE OF RUSSIAN*. Spring term. Credit three hours. Prerequisite, proficiency in Russian and Linguistics 201. M W F 2. Mr. FAIRBANKS.

A descriptive study and analysis of Russian linguistic structure. Russian phonetics, phonemics, morphology, and syntax.

241. *HISTORY OF THE RUSSIAN LANGUAGE*. Fall term. Credit three hours. Prerequisite, proficiency in Russian. M W F 2. Mr. FAIRBANKS.

The study of the divisions of the Russian language chronologically and geographically; the relationships of the Russian language, the Slavic group, the Indo-European group; the changes in the sounds and forms of the Russian language; vocabulary borrowings from Eastern and Western languages.

301-302. *SURVEY OF RUSSIAN LITERATURE*. Throughout the year. Credit three hours a term. Prerequisite, proficiency in Russian. M W F 11. Mr. NABOKOV.

Lectures in Russian and classroom exercises on the development of Russian literature, with particular emphasis on the nineteenth century.

315-316. *PUSHKIN*. Throughout the year. Credit three hours a term. Prerequisite, proficiency in Russian. Hours to be arranged. Mr. NABOKOV.

Reading and critical study of Pushkin's works.

[317-318. *THE MODERNIST MOVEMENT IN RUSSIAN LITERATURE FROM ITS SOURCES TO OUR TIME: POETRY AND PROSE*. Throughout the year. Credit three hours a term. Prerequisite, proficiency in Russian. Hours to be arranged. Mr. NABOKOV. Not offered in 1951-52.]

## SPANISH

Messrs. F. B. AGARD, G. I. DALE, C. C. HARRIS, and STAFF.

*Courses numbered below 300 are offered by the Division of Modern Languages and those numbered 300 and higher are offered by the Department of Romance Literature. All courses above 199 presuppose proficiency in Spanish.*

*Students desiring to major in Spanish may choose between two programs: (1) Spanish Literature, (2) Spanish Linguistics.*

*For a major in Spanish Literature, consult Mr. DALE. The student must complete (1) eighteen hours of courses numbered from 301-399; (2) twelve hours of courses in a second literature (except that English 111-112 may not be counted); (3) in related subjects, eighteen hours to be selected from Languages and Literatures, European History, Fine Arts, Music History, History of Philosophy, Cultural Anthropology 604, and Dramatic Production; except that the twelve hours of courses specified under (2) above may not be counted as a related subject.*

*For a major in Spanish Linguistics, consult Mr. AGARD. The following courses must be completed: (1) Linguistics 201 and 202; (2) Spanish 214, 224, 232, 241 and 242; (3) Spanish Literature 301-302 or 303-304; (4) at least twelve hours in related subjects.*

\*101. *ELEMENTARY COURSE*. Either term. Credit six hours. Students who have previously studied any Spanish must take the proficiency examination before registering for this course. Hours as assigned.

\*102. *ELEMENTARY COURSE*. Either term. Credit six hours. Prerequisite, Spanish 101 or its equivalent. Students who have not completed Spanish 101 (except those currently enrolled in Spanish 101) must take the proficiency examination before registering for this course. Hours as assigned.

\*103. *ELEMENTARY COURSE*. Either term. Credit three hours. Open only to students with credit for Spanish 102 who have failed the proficiency examination. T Th S 9.

\*201. *INTERMEDIATE READING COURSE*. Either term. Credit three hours. Prerequisite, a satisfactory proficiency examination, or Spanish 103. T Th S 9.

\*203. *INTERMEDIATE COMPOSITION AND CONVERSATION*. Either term. Credit three hours. Prerequisite, a satisfactory proficiency examination, or Spanish 103. M W F 9 or 11, T Th S 11.

214. *INTERMEDIATE COMPOSITION AND CONVERSATION*. Either term. Credit three hours. Prerequisite, Spanish 203. M W F 2.

224. *ADVANCED COMPOSITION AND CONVERSATION*. Spring term. Credit three hours. Prerequisite, Spanish 214. T Th S 11.

232. *THE LINGUISTIC STRUCTURE OF SPANISH*. Spring term. Offered in alternate years. Credit three hours. Prerequisite, proficiency in Spanish and Linguistics 201. M W F 12. Mr. AGARD.

Descriptive study and analysis of Spanish linguistic structure. Spanish phonetics and phonemics: the sounds of Spanish with special attention to contrast with English sounds; syllable structure; stress and intonation. The forms and sequences of forms of the language, studied from the point of view of speech and of its written representation. The results of linguistic analysis contrasted with traditional grammatical description. Lectures, discussion, and exercises.

[241-242. *HISTORY OF THE SPANISH LANGUAGE*. Throughout the year. Credit three hours a term. Prerequisite, proficiency in Spanish. M W F 12. Mr. AGARD. Offered in alternate years. Not offered in 1951-52.]

[301-302. *SURVEY OF SPANISH LITERATURE*. Not offered in 1951-52.]

303-304. *SURVEY OF SPANISH-AMERICAN LITERATURE*. Throughout the year. Credit three hours a term. Prerequisite Spanish 201, or four years of entrance Spanish, or consent of the instructor. The course may be entered in the second term. M W F 11. Mr. DALE.

Lectures in Spanish and classroom discussions on Spanish-American literature from the Colonial period to the present.

311-312. *CERVANTES*. Throughout the year. Credit three hours a term. T Th S 11. Mr. DALE.

The *Novelas Ejemplares* and *Don Quijote* will be read, with critical, interpretative, and historical study.

319-320. *THE NINETEENTH-CENTURY SPANISH NOVEL*. Throughout the year. Credit three hours a term. The course may be entered in the second term. T Th S 10. Mr. DALE.

Reading and critical study of the most significant novels.

[321-322. *THE CONTEMPORARY SPANISH-AMERICAN NOVEL*. Not offered in 1951-52.]

381-382. *LOPE DE VEGA*. Throughout the year. Credit two hours a term. Hours to be arranged. Mr. DALE.

For graduates and qualified undergraduates. A critical study of the dramatic art of Lope de Vega.

[385-386. *THE PICARESQUE NOVEL*. Not offered in 1951-52.]

## THAI (SIAMESE)

Mr. GEDNEY and STAFF.

\*101. *ELEMENTARY COURSE*. Fall term. Credit six hours. Hours as assigned.

\*102. *ELEMENTARY COURSE*. Spring term. Credit six hours. Prerequisite, Thai 101. Hours as assigned.

\*103. *ELEMENTARY COURSE*. Either term. Credit three hours. Open only to students with credit for Thai 102 who have failed the proficiency examination. Hours to be arranged.

## MUSIC

Mr. JOHN KIRKPATRICK, *Chairman*; Messrs. WILLIAM AUSTIN, WILLIAM CAMPBELL, KEITH FALKNER, DONALD J. GROUT, ROBERT HULL, HUNTER JOHNSON, ROBERT PALMER, and Mrs. MARGARET MARTIN.

*For a major in Music, the following must be completed: (1) (a) Music 101-102 (for 102 either 106 or 108 may be substituted); (b) Music 201-202, 203-204, 301-302, and six hours from Music 303 through 312; (c) four hours in Music 401-402 and four terms in Music 319-320; (2) in related subjects, a minimum of fifteen hours to be chosen with the approval of the adviser; (3) at least two years' membership and participation in either the University Orchestra, the Sage Chapel Choir, the Cornell A Capella Chorus, or the Concert Band.*

*Students who are considering music as a possible major field should consult the chairman of the Department at the beginning of their freshman year or as soon thereafter as possible.*

*A large collection of recorded music and scores is housed in the Music Building at 320 Wait Avenue, where a number of phonograph listening rooms are available. These facilities may be used by any member of the student body at hours to be announced each term.*

*Choral and instrumental ensembles are trained and directed by members of the departmental staff each term, and all students who are interested are invited to join these groups. These ensembles include the Sage Chapel Choir, the Cornell A Capella Chorus, the Bands, the Orchestra, and Chamber Music Groups. Announcements of tryouts will be made at the beginning of each term. For rehearsal hours, see the hours listed for Music 406 through 412.*

## MUSIC THEORY

103-104. *THEORY I: THE FUNDAMENTALS OF MUSIC.* Throughout the year. Credit three hours a term. M through F 9. Messrs. CAMPBELL and JOHNSON.

*A study of the fundamentals of music through ear training, use of the keyboard, and simple part writing. Includes scales, triads, intervals, and keys; rhythmic, harmonic, and melodic dictation; sight-singing; writing of melody and simple four-part harmony.*

*Section 1 is for music majors and qualified nonmajors.*

*Section 2 is for the general student. Auditions held at the first class meeting will determine the section in which the student is to be placed.*

201-202. *THEORY II: HARMONY.* Throughout the year. Credit three hours a term. Prerequisite, Music 103-104 or the equivalent. M W F 10 and Th 2. Mr. JOHNSON.

*A study of harmonic principles of the period of common practice (1700-1900). The materials and techniques of the period will be practiced through writing, hearing, analysis, playing, and composition in the simpler homophonic forms. Advanced dictation, sight-singing, and keyboard harmony.*

203-204. *THEORY III: COUNTERPOINT.* Throughout the year. Credit three hours a term. Prerequisite, Music 201-202, or the equivalent. M W F 12. Mr. JOHNSON.

*The general principles of counterpoint will be studied by examining the contrapuntal practice of the Baroque period as exemplified chiefly in the works of J. S. Bach. There will be analysis and composition in the polyphonic forms of the period.*

209-210. *THEORY IV: COMPOSITION IN TWENTIETH-CENTURY STYLE.* Throughout the year. Credit two hours a term. Hours to be arranged. Prerequisite, Music 203-204. (Music 203-204 may be taken concurrently with Music 209-210.) Mr. JOHNSON.



The study of twentieth-century harmonic and contrapuntal techniques and their application in original composition.

[207-208. *ORCHESTRATION AND CONDUCTING*. Throughout the year. Credit three hours a term. Prerequisites, Music 101-102 and 103-104, or the equivalents. M W F 2. Messrs. CAMPBELL and JOHNSON. Not offered in 1951-52.]

[021-022. *INFORMAL STUDY*. Credit hours to be arranged. Mr. PALMER. Not offered in 1951-52.]

023-224. *INFORMAL STUDY*. Credit hours to be arranged. Mr. HULL.

## MUSIC HISTORY

101. *THE ART OF MUSIC*. Fall term. Credit three hours. Open to all students. Lectures: T Th 11; recitation sections to be arranged. Mr. AUSTIN.

102. *THE ART OF MUSIC*. Spring term. Credit three hours. Prerequisite, Music 101, or consent of the instructor. T Th S 11. Mr. AUSTIN.

An approach to the understanding and rational enjoyment of the art of music, offered especially for students who have had little or no technical training in the subject. Students who are considering music as a possible major field should register for this course in their freshman year. The first term covers a study of the elements of music, media of musical expression, and musical forms. The second term covers a study of the work of representative composers in relation to their social and artistic environment. Most of the outside work in this course consists of attending concerts and studying phonograph records.

[106. *THE GREAT TRADITION IN MUSIC*. Spring term. Credit three hours. Prerequisite, Music 101. Enrollment limited, instructor's consent required. T Th S 11. Mr. GROUT. Not offered in 1951-52.]

108. *PIANO MUSIC*. Spring term. Credit three hours. Prerequisite, Music 101. Enrollment limited, instructor's consent required. T Th S 11. Mr. KIRKPATRICK.

A survey of the literatures of the piano and its forerunners, emphasizing the relation of keyboard styles to the changing musical scene.

301-302. *HISTORY OF MUSIC*. Throughout the year. Credit three hours a term. Prerequisites, Music 101-102 and Music 201-202; the latter may be taken concurrently with Music 301-302. T Th S 9. Mr. HULL.

The development of the art of music from the Middle Ages to the present, with a study of compositions representative of the principal styles.

[303-304. *MUSIC OF THE RENAISSANCE*. Throughout the year. Credit three hours a term. Prerequisites, Music 201-202 and 301-302. M W F 10. Mr. GROUT. Not offered in 1951-52.]

[305-306. *MUSIC OF THE BAROQUE PERIOD*. Throughout the year. Credit three hours a term. Prerequisites, Music 201-202 and 301-302. T Th S 8. Mr. AUSTIN. Not offered in 1951-52.]

[307-308. *MUSIC OF THE CLASSICAL PERIOD*. Throughout the year. Credit three hours a term. Prerequisites, Music 101-102 and 301-302. M W F 10. Mr. GROUT. Not offered in 1951-52.]

311. *CONTEMPORARY MUSIC*. Fall term. Credit three hours. Prerequisites,

Music 301-302 and Music 203-204; the latter may be taken concurrently with Music 311. M W F 11. Mr. KIRKPATRICK.

The growth of special trends in Europe and the reactions to them.

312. *CONTEMPORARY MUSIC*. Spring term. Credit three hours. Prerequisite, Music 311. M W F 11. Mr. KIRKPATRICK.

American reflections of European influence and native developments.

319-320. *COLLEGIUM MUSICUM*. Throughout the year. Credit one hour a term. Prerequisite, consent of the instructor. Required of all music majors for at least two years, usually in the junior and senior year. A student may register for this course in successive years but may not receive more than four terms credit for this course. T 2-3:40. Mr. HULL, assisted by members of the Department.

A study of selected works from all periods in the history of music through analysis, editing, conducting, and performing. The techniques and objectives will be the same each year, but the materials covered will not be the same in any two successive years.

031-032. *INFORMAL STUDY*. Credit hours to be arranged. Mr. AUSTIN.

[033-034. *INFORMAL STUDY*. Credit hours to be arranged, Mr. GROUT. Not offered in 1951-52.]

041-042. *INFORMAL STUDY*. Credit hours to be arranged. Mr. KIRKPATRICK.

043-044. *INFORMAL STUDY*. Credit hours to be arranged. Mr. FALKNER.

### APPLIED MUSIC

401-402. *INDIVIDUAL INSTRUCTION IN VOICE; ORGAN; PIANO; STRING, WOODWIND, AND BRASS INSTRUMENTS*. Throughout the year. Each course, for two half-hour lessons a week, carries two hours' credit a term, provided that the student shall have earned double that number of credits in music courses other than those in the 400 category. A student may register for this course in successive years. Open to all students by permission of the instructor. Students should consult the instructor at the beginning of each term as to hours for instruction, and the secretary of the Department as to hours for use of practice rooms. Messrs. FALKNER, AUSTIN, CAMPBELL, HULL, KIRKPATRICK, Mrs. MARTIN.

For violin and viola instruction with Mr. HULL, for piano instruction with Mrs. MARTIN, for instruction in woodwind and brass instruments with Mr. CAMPBELL, and for organ instruction with Mr. AUSTIN, there is a fee of \$40 for one half-hour lesson a week each term. For vocal instruction with Mr. FALKNER, and for piano instruction with Mr. KIRKPATRICK, there is a fee of \$60 for one half-hour lesson a week each term. A fee of \$10 a term is charged for a daily one-hour assignment to a practice room equipped with a piano. A fee of \$30 a term is charged for a daily one-hour assignment for the use of a pipe organ in Bailey Hall or Barnes Hall.

### MUSICAL ORGANIZATIONS AND ENSEMBLES

*Throughout the year. Credit one hour for two terms. Students desiring credit for work in these courses should register informally with the Music Department in the fall term, and register formally in the College for the appropriate course in the spring term. Registration is permitted in two of these courses simultaneously, and students may register in successive years, but no student may earn more than four hours of credit in these courses.*

406. *THE SAGE CHAPEL CHOIR*. T 7:15-8:15 p.m. and Th 7:30-9 p.m. Mr. FALKNER.

408. *THE CORNELL A CAPPELLA CHORUS*. M W F 4:30-5:30 p.m. Mr. HULL.

410. *UNIVERSITY ORCHESTRA*. T 7:15-8:15 p.m., strings only, and W 7:30-10 p.m., full orchestra. Mr. HULL.

412. *UNIVERSITY CONCERT BAND*. Th 7:30-9:30 p.m. and F 4:30-6 p.m. Mr. CAMPBELL.

## COURSES PRIMARILY FOR GRADUATES

275-276. *SEMINAR IN COMPOSITION*. Throughout the year. Credit two hours a term. Open to seniors by permission. Hours to be arranged. Mr. JOHNSON.

The work is intended to make the student acquainted with compositional practices in contemporary styles and to develop the student's creative abilities.

[277-278. *ANALYTIC TECHNIQUE*. Throughout the year. Credit three hours a term. Prerequisite, Music 203-204 or the equivalent. M W 1-3. Mr. PALMER. Not offered in 1951-52.]

375-376. *INTRODUCTION TO RESEARCH*. Throughout the year. Credit two hours a term. Prerequisites, a reading knowledge of French and German and an elementary knowledge of music theory and general music history. Open to seniors by permission. M 10-12. Mr. AUSTIN.

The basic materials and techniques of musicological research.

377-378. *SEMINAR IN MUSICOLOGY*. Throughout the year. Credit two hours a term. W 10-12. Mr. AUSTIN.

This course is primarily for graduates (and, by permission, seniors) who have (1) the requisite knowledge of one or more of the important foreign languages, (2) a fair knowledge of music theory, and (3) some skill in applied music and score reading. The topic for the seminar in 1951-52 is "A Comparative Study of J. S. Bach and Italian Composers of the 17th Century."

## PHILOSOPHY

Mr. ARTHUR E. MURPHY, *Chairman*; Messrs. MAX BLACK, S. M. BROWN, WILLIS DONEY, E. A. BURTT, NORMAN MALCOLM, HAROLD R. SMART, GREGORY VLASTOS.

*For a major in Philosophy, the standard requirement is as follows: (1) in Philosophy twenty-one hours, including Philosophy 301-302 and one advanced course, all to be chosen with the approval of the student's adviser; (2) in related subjects, eighteen hours, to be chosen with the approval of the adviser. This requirement, however, will be diminished by six hours to allow for a final comprehensive examination, if the students elect to take such an examination. The courses thus to be omitted will be determined by the adviser. The major may emphasize aesthetics, social studies, history, logic, or religion. In each case an integrated program of studies must be selected, subject to the approval of the adviser. Informal study is open to qualified majors.*

*Students registered in the combined Arts-Law course with a major in Philosophy will be required to complete twelve hours in Philosophy, including Philosophy 301-302, and nine hours in related subjects.*

\*101. *PHILOSOPHICAL CLASSICS*. Either term. Credit three hours. Open to freshmen. Fall term, M W F 8 or 11; T Th S 9 or 12. Spring term, M W F 9 or 11; T Th S 9, 10 or 12. Messrs. BROWN, BURTT, DONEY, MURPHY, SMART, and VLASTOS.

A careful study of three Socratic dialogues, Plato's *Republic*, and J. S. Mill's *Utilitarianism* and *On Liberty*. In studying Plato and Mill, special attention is paid to the philosophy of democracy.

\*102. *PHILOSOPHICAL CLASSICS: SECOND COURSE*. Either term. Credit three hours. Prerequisite, Philosophy 101. Fall term, M W F 9; T Th S 12. Spring term, M W F 8 or 12; T Th S 9 or 12. Messrs. BROWN, DONEY, MALCOLM, and SMART.

In classical texts of somewhat greater difficulty than those examined in Philosophy 101, the student is offered a choice between two sets of selected readings. Fall term: Descartes, Berkeley, and Hume, with an emphasis upon the problems in theory of knowledge. Spring term: Hobbes, Locke, and Hume, with an emphasis upon the problems in ethical and social values. No student may elect both terms.

\*103. *ELEMENTARY LOGIC*. Either term. Credit three hours. Open to freshmen. Fall term, M W F 8 or 12; T Th S 10. Spring term, M W F 8 or 11. Messrs. DONEY and MALCOLM.

An elementary study of valid inference, inductive methods, and the causes of fallacy.

202. *ELEMENTARY SEMANTICS*. Fall term. Credit three hours. Open to sophomores and upperclassmen. T Th S 9. Mr. DONEY.

A survey of the philosophy of language and symbolism, with detailed practice in interpretation. Topics include sign-using behavior, the nature of language, special types of discourse (scientific, poetic, mathematical), semantic fallacies. Lectures and discussion.

221-222. *ETHICS*. Throughout the year. Credit three hours a term. First term prerequisite to the second. Open to sophomores and upperclassmen. Fall term: lectures, M W 11, one recitation, Th F or S 11; second term, M W F 11. Mr. BROWN.

Fall term: basic moral ideas of Western civilization as interpreted by its major philosophers; Greek and Christian ethics; the rise of modern liberalism, contemporary issues. Spring term: the meaning and tests of value judgments; the structure, conditions, and ends of a moral community; application to current social problems.

230. *AESTHETICS: PHILOSOPHY OF ART*. Fall term. Credit three hours. Open to students majoring in Philosophy or in Fine Arts, and to others by consent of the instructor. T Th S 11. Mr. SMART.

A critical study of certain outstanding theories of art, ancient, modern, and contemporary.

## COURSES FOR UPPERCLASSMEN AND GRADUATES

301-302. *HISTORY OF PHILOSOPHY*. Throughout the year. Credit three hours a term. Open to juniors and seniors, and others with the consent of the instructor. T Th S 9. Fall term, Mr. VLASTOS; spring term, Mr. MURPHY.

Occidental philosophical thought from its Greek origins to the nineteenth cen-

tury; the most important systems in their cultural context. Fall term, ancient and medieval period; spring term, modern period.

[312. *PHILOSOPHY IN CONTEMPORARY THOUGHT*. Spring term. Credit three hours. Prerequisite, six hours of Philosophy or consent of the instructor. Mr. MURPHY. Not given in 1951-52.]

Main tendencies in recent analytic and speculative philosophy in their relation to current literature, politics, theology, and philosophy of history.

313. *AMERICAN PHILOSOPHY*. Fall term. Credit three hours. Open to juniors and seniors, M W F 10. Mr. MURPHY.

The development of American thought from Jonathan Edwards to the present. Puritanism, the Enlightenment; transcendentalism, evolutionary science and religion, the philosophies of Royce, James, and Dewey.

321. *HISTORY OF RELIGIONS*. Fall term. Credit three hours. Open to juniors and seniors, and to sophomores by consent of the instructor. M W F 12. Mr. BURTT.

A general survey of the development of ritual, practice, and belief in selected primitive religions and the religions of the Far East, of India, and of the West.

322. *PHILOSOPHY OF RELIGION*. Spring term. Credit three hours. Open to juniors and seniors, and to sophomores by consent of the instructor. M W F 12. Mr. BURTT.

A study of the major types of religious belief in the modern world in relation to their philosophical background and to the moral and social problems of today.

323. *DEDUCTIVE LOGIC*. Fall term. Credit three hours. Prerequisite, Philosophy 103 or consent of the instructor. Time of meeting and instructor to be announced.

A study of current methods and problems of formal logic, with discussion of relevant philosophical issues: algebra of classes, propositional calculus, calculus of functions, the logical paradoxes, and the theory of types.

324. *INDUCTIVE LOGIC*. Spring term. Credit three hours. Prerequisite, Philosophy 323 or consent of the instructor. Time of meeting and instructor to be announced.

An introduction to the philosophy of induction and the foundations of probability. Topics to be discussed include the justification of induction, connections between induction and probability, the classical and frequency views of probability, the "Law of Large Numbers."

325-326. *HISTORY OF POLITICAL THEORY*. Throughout the year. Credit three hours a term. Prerequisite, Philosophy 221-222 or 301-302, or consent of the instructor. T Th S 11. Mr. VLASTOS.

A study of the philosophical and ethical assumptions in each of the main types of Western political thought. Fall term: the political philosophies of Greece, Rome, and Medieval Europe. Spring term: the political philosophies of Modern Europe.

327. *THEORY OF KNOWLEDGE*. Fall term. Credit three hours. Open to philosophy majors, graduate students, and others with the consent of the instructor. M W F 11. Mr. MALCOLM.

Topic for 1951-52: Moore and Prichard on knowledge and perception.

424. *PHILOSOPHY OF SCIENCE*. Spring term. Credit three hours. Prerequisite, Philosophy 323 or consent of the instructor. Time of meeting and instructor to be announced.



A critical analysis of scientific methodology with detailed study of such topics as causality, theories, fictions, measurement.

425. *ETHICAL THEORY*. Fall term. Credit three hours. Prerequisite, Philosophy 221-222, or 301-302, or 325-326, or consent of the instructor. M W F 2. Mr. BROWN.

Topic for 1951-52: Christian ethics; the ethical theories of Augustine, Aquinas, Luther, Calvin, Joseph Butler, and Nygren.

[427. *RECENT PHILOSOPHY 1890-1940*. Fall term. Credit three hours. Open to philosophy majors, graduate students, and others with the consent of the instructor. Mr. MURPHY. Not given in 1951-52.]

[431. *SEVENTEENTH-CENTURY RATIONALISM*. Fall term. Credit three hours. Prerequisite, Philosophy 102, or Philosophy 302, or consent of the instructor. Mr. DONEY. Not given in 1951-52.]

434. *NINETEENTH-CENTURY PHILOSOPHY*. Spring term. Credit three hours. Prerequisite, Philosophy 302 or consent of the instructor. T Th S 9. Mr. SMART. Post-Kantian Idealism, Evolutionary Doctrines, Positivism, and Realism.

481. *AESTHETICS: ADVANCED COURSE*. Spring term. Credit three hours. T Th S 11. Mr. SMART.

An intensive study of selected problems in the field.

485. *PHILOSOPHY OF RELIGION: ADVANCED COURSE*. Spring term. Credit three hours. Prerequisite, Philosophy 322 or consent of the instructor. Th 2-4. Mr. BURTT.

An intensive study of selected problems in the field, with critical comparison of basic ideas in Judaism, Christianity, and Oriental religions.

Topic for 1951-52: Existentialism: Its Significance for Religious Philosophy.

*SYMBOLIC LOGIC*. (See Mathematics 382.)

575-576. *PLATO AND ARISTOTLE*. Throughout the year. Credit three hours a term. M 3-5. Mr. VLASTOS.

579-580. *MODERN PHILOSOPHERS*. Throughout the year. Credit three hours a term. Fall term: Locke. Th 2-4. Mr. BURTT. Spring term: Berkeley and Reid. W 3-5. Mr. DONEY.

[581-582. *SEMANTICS AND LOGIC*. Throughout the year. Credit three hours a term. Mr. BLACK. Not given in 1951-52.]

[584. *SEMINAR IN POLITICAL PHILOSOPHY*. Spring term. Mr. VLASTOS. Not given in 1951-52.]

585. *ADVANCED ETHICS AND VALUE THEORY*. Fall term. Credit three hours. Open to graduates and seniors by consent of the instructor. W 3-5. Mr. MURPHY.

Topic for 1951-52: Can there be a "General Theory of Value?"

[587-588. *METAPHYSICS*. Fall and spring terms. Credit three hours. Mr. BURTT. Not given in 1951-52.]

[590. *SEMINAR IN GREEK PHILOSOPHY*. Fall term. Credit three hours. Mr. VLASTOS. Not given in 1951-52.]

[592. *SEMINAR IN MODERN PHILOSOPHY*. Spring term. Not given in 1951-52.]

594. *SEMINAR IN PHILOSOPHICAL ANALYSIS*. Spring term. Credit three hours a term. Th 11-1. Mr. MALCOLM.

Toxic for 1951-52: meaning.

[595. *SEMINAR IN SEMANTICS AND LOGIC*. Fall term. Credit three hours. Open to graduate students. Mr. BLACK. Not given in 1951-52.]

039. *INFORMAL STUDY*. Members of the Department.

## PHYSICS

Mr. L. P. SMITH, *Chairman*; Messrs. (C. P. BAKER, Nuclear Studies), L. L. BARNES, H. A. BETHE, G. COCCONI, D. R. CORSON, (T. R. CUYKENDALL, Engineering Physics), J. W. DE WIRE, F. J. DYSON, C. W. GARTLEIN, G. E. GRANTHAM, K. I. GREISEN, P. L. HARTMAN, J. A. KRUMHANS, J. S. LEVINGER, B. D. McDANIEL, P. MORRISON, C. C. MURDOCK, H. F. NEWHALL, L. G. PARRATT, (H. S. SACK, Engineering Physics), E. E. SALPETER, N. SCHWARTZ, (B. SIEGEL, Engineering Physics), R. L. SPROULL, D. H. TOMBOULIAN, R. R. WILSON, and W. M. WOODWARD.

*For a major in Physics, the following courses must be completed: (1) in Physics, twenty-four hours of courses numbered above 116 (excluding courses 200 and 214), which shall include at least three hours of Physics 210 or its equivalent and nine hours selected from classroom credit in Physics 215-254; (2) in related subjects, Mathematics 201 and twelve hours in one of the following groups: (a) Chemistry, (b) Astronomy, (c) Biological Science (six hours of this must not be an introductory course), (d) Philosophy (History 165 and 166, or 911-912 may be substituted for six hours of Philosophy), (e) Geology (six hours of this must not be an introductory course).*

\*103. *GENERAL PHYSICS*. Fall term. Credit three hours. Demonstration lectures, M F 9 or 12. One combined laboratory period and quiz section as arranged.

Courses 103-104 are not intended as preparatory for more advanced courses in physics except Physics 200, although admission to other courses following Physics 103-104 can be obtained by special permission. It is recommended that students majoring in mathematics or in a physical science elect Physics 107-108 instead of Physics 103-104.

\*104. *GENERAL PHYSICS*. Spring term. A continuation of Physics 103. Prerequisite, Physics 103 or entrance physics. Hours as in Physics 103.

\*107. *INTRODUCTORY PHYSICS*. Fall term. Credit four hours. Demonstration lecture, W 11. Three recitations and one laboratory period a week, as arranged. Prerequisite, Calculus or concurrent registration in Mathematics 161 or 172. Mr. GREISEN, Mr. LEVINGER, and assistants.

Mechanics, heat, and electricity. Primarily for students majoring in science.

\*108. *INTRODUCTORY PHYSICS*. Spring term. Credit four hours. A continuation of Physics 107. Prerequisite, Physics 107 or 103 and consent of the instructor. Hours and staff as in Physics 107.

Mechanics, electricity, and light.

*Note: Physics 115, 116, 117, and 118 form a sequence in a two-year continuous course in General Physics required of all students of engineering who are candidates for the degrees of B.Chem. E.,*

*B.C.E., B.E.E., B.Eng. Physics, and B.M.E. Demonstrations, theory, experiments, and problem drill. One lecture, two recitations, and one laboratory period a week, as assigned. Consult instructor in charge for available recitation and laboratory periods other than the ones described below.*

115. *MECHANICS*. Fall term. Credit three hours. Prerequisite, Calculus or simultaneous registration in Mathematics 161. Entrance physics is desirable but not required. Lecture, Th 9 or 11. Recitations, M F 9. Laboratory, M 2-4:30. Mr. GRANTHAM, Mr. NEWHALL, Mr. SCHWARTZ, and assistants.

Kinetics, statics, elasticity, liquids, and mechanics of gases. The laboratory work consists of measurements of length, acceleration, velocity, elasticity, harmonic motion, moment of inertia, mass, centripetal force, and density.

116. *HEAT, SOUND, AND GEOMETRICAL OPTICS*. Spring term. Credit three hours. Prerequisites, Physics 115, Calculus, or simultaneous registration in Mathematics 162. Lecture, Th 9 or 11. Recitations, M F 9. Laboratory, M 2-4:30. Mr. GRANTHAM, Mr. NEWHALL, Mr. SCHWARTZ, and assistants.

Temperature, calorimetry, change of state, heat transfer, thermal properties of matter, elementary thermodynamics, wave motion, vibrating bodies, acoustical phenomena, geometrical optics, reflection, refraction, mirrors, and lenses. The laboratory work consists of measurements related to the above topics.

117. *ELECTRICITY AND MAGNETISM*. Fall term. Credit three hours. Prerequisites, Physics 115, 116, Calculus, or simultaneous registration in Mathematics 163. Lecture, T 8 or 11. Recitations, T Th 10. Laboratory, M 2-4:30. Mr. TOMBOULIAN, Mr. NEWHALL, and assistants.

Introductory study of the fundamental laws of electric and magnetic fields and their applications to elementary circuit problems. Electrostatic fields and potential; steady currents, induced emfs, inductance, dielectrics, capacitance, and simple transients. The laboratory work consists of basic measurements in direct current circuits.

118. *PHYSICAL ELECTRONICS AND OPTICS*. Spring term. Credit three hours. Prerequisite, Physics 117. Lecture, T 8 or 11. Recitations, T Th 10. Laboratory, M 2-4:30. Mr. TOMBOULIAN, Mr. NEWHALL, and assistants.

Further study of topics in electricity such as magnetic properties of matter, alternating currents, and electric oscillations. Selected topics in thermionics, photoelectricity, motion of ions in electric and magnetic fields, physical optics, including interference, diffraction and polarization, atomic and nuclear physics. The laboratory work consists of measurements in electronics such as the determination of work function, characteristics of photo cells, cut off curves of magnetrons, dispersion, diffraction, resolving power, polarized light, and absorption of gamma rays.

200. *PHYSICS FOR STUDENTS OF BIOLOGY*. Either term. Credit three hours. Prerequisite, six semester hours of college work in each of the following: physics, chemistry, and biological science. Students having grades below 70 in Physics 103 and 104 are not encouraged to elect this course. Lectures, T Th 12. Laboratory, T or Th 2-4. Mr. BARNES.

Lectures, demonstrations, and laboratory experiments dealing with such topics in molecular physics, electricity and magnetism, electromagnetic radiation, and nuclear physics as are related to the study of biology.

203. *ADVANCED GENERAL PHYSICS*. Fall term. Credit three hours. Prerequisites,

Physics 107 and 108, or consent of instructor, and Mathematics 172 (or in parallel). M W F 9. Mr. KRUMHANSL.

Mechanics, probability, wave motion, and sound.

205. *ADVANCED GENERAL PHYSICS LABORATORY*. Fall term. Credit two hours. Prerequisite, Physics 203 (or concurrent registration). M W 1:40-4:30. Mr. KRUMHANSL.

Laboratory experiments in subject matter of Physics 203.

204. *ADVANCED GENERAL PHYSICS*. Spring term. Credit three hours. Prerequisites, Physics 203 and Mathematics 173 (or in parallel). M W F 9. Mr. CORSON.

Electricity, magnetism, optics, and atomic physics.

206. *ADVANCED GENERAL PHYSICS LABORATORY*. Spring term. Credit two hours. Prerequisite, Physics 204 (or in parallel). M W 1:40-4:30. Mr. CORSON.

Laboratory experiments on subject matter of Physics 204.

208. *PHYSICAL MECHANICS AND PROPERTIES OF MATTER*. Spring term. Credit three hours. Prerequisites, Physics 115 and Mathematics 161 and 162. Primarily for candidates for the degree of Bachelor of Engineering Physics. M W F 10. Mr. HARTMAN.

Elements of kinematics; Newton's law, conservation laws; D'Alembert's principle; application to selected problems; hydrostatics; elementary fluid dynamics; viscosity; surface tension.

210. *ADVANCED LABORATORY*. Either term. Credit three hours a term. Prerequisites, Physics 205 and 206 or the equivalent. Laboratory, T W or Th F 1:40-4:30, and seminar period M 1:40 or Th 4:30. Messrs. PARRATT, CORSON, CUY-KENDALL, HARTMAN, KRUMHANSL, McDANIEL, and WOODWARD.

Experimental work in a wide variety of fields is offered to meet the needs of the individual student. Considerable time may be spent on a relatively few topics, or many experiments may be performed to gain acquaintance in several fields. The laboratory work is individual, and stress is laid on independent work on the part of the student. Among the topics for which facilities are available are mechanics, acoustics, optics, spectroscopy, electrical circuits, electronics and ionics, heat and high temperature measurements, x-rays, crystal structure, cosmic rays, and nuclear physics.

214. *ATOM, NUCLEAR, AND ELECTRON PHYSICS*. Spring term. Credit three hours. Two lectures and one recitation. Prerequisites, Physics 118 and Mathematics 608 or the equivalents. Primarily for students in electrical engineering. Mr. SPROULL.

Elements of nuclear and atomic structure, fundamentals of quantum theory, basic kinetic theory of atoms and electrons; electronic processes with special reference to the electrical properties of metals, semiconductors, and insulators and general electron emission processes; elements of nuclear processes.

215. *PHYSICAL OPTICS*. Fall term. Credit three or five hours. Prerequisites, Physics 206 or the equivalent and calculus. Lectures, M W F 9. Laboratory, Th F 1:40-4:30; also T W 1:40-4:30 if a second section is warranted. Mr. HARTMAN.

Huygens and Fermat's principles with applications to geometrical optics; velocity of light; Fraunhofer and Fresnel diffraction; polarization of light, double refraction, optical activity; electromagnetic characteristics, dispersion, absorption, and reflection.

225. *ELECTRICITY AND MAGNETISM*. Either term. Credit three hours. Prerequisite, Physics 117 or 206. Lectures, T Th S 9, and an optional problem period to be arranged. Fall term, Mr. MURDOCK; spring term, Mr. McDANIEL.

Electrostatic and electromagnetic fields, polarization of dielectrics and magnetic media, displacement current, plane electromagnetic waves, the Poynting vector.

236. *ELECTRICITY AND MAGNETISM*. Spring term. Credit three hours. Prerequisites, Physics 225 and Differential Equations. Lectures, M W F 11. Mr. COCCONI.

Circuit theory from the standpoint of electromagnetic fields. Validity and limitation of circuit concepts. Steady and alternating currents in circuits and networks, transients, distributed parameters, introductory high frequency topics.

242. *ANALYTICAL MECHANICS*. Spring term. Credit three hours. Prerequisites, Physics 205 or 208 and Mathematics 201, or their equivalents. T Th S 9. Mr. WOODWARD.

Analytical mechanics of material particles, systems of particles, and rigid bodies; planetary motion, stability of orbits; collisions; Euler's equations, gyroscopic motion; Lagrange's equations.

243. *ATOMIC AND MOLECULAR PHYSICS*. Fall term. Credit three hours. Prerequisite, Physics 225, or consent of the instructor. M W F 10. Mr. DE WIRE.

The fundamental particles; statistical physics; the concepts of quantum mechanics; atomic structure and spectra; the periodic table; molecular structure and the chemical bond; fundamentals of nuclear physics.

254. *ELECTRONIC PROPERTIES OF SOLIDS AND LIQUIDS*. Spring term. Credit three hours. Prerequisite, Physics 243. T Th S 9. Mr. SACK.

Lattice structure; specific heat, lattice energy, elastic properties; electric conduction; thermoelectric effects; contact potential; barrier effect; lattice defects; dielectric, magnetic, and optical properties.

258. *MECHANICS OF CONTINUA*. Spring term. Credit three hours. Prerequisite, Partial Differential Equations or consent of the instructor. M W F 10. Mr. SACK.

Equations of state for gases, liquids, solids. Stress-strain relations for continuous media and equations of motion. Special topics in statics of elastic media. Waves and oscillations in continuous media. Topics in flow, and nonlinear phenomena in gases and fluids.

020. *INFORMAL STUDY IN PHYSICS*. Either term. Reading or laboratory work in any branch of Physics under the direction of a member of the staff. Hours to be arranged.

380. *ADVANCED LABORATORY*. Either term. Credit three hours a term. Prerequisite, Physics 210 or its equivalent. Laboratory, T W or Th F 1:40-4:30. Messrs. PARRATT, CORSON, CUYKENDALL, HARTMAN, KRUMHANSL, McDANIEL, and WOODWARD.

[383. *X-RAY EXPERIMENTS*. Fall term. Credit two or three hours. Not offered in 1951-52.]



391. *ELECTRONICS AND IONICS*. Fall term. Credit three hours. Prerequisite, one term of Physics 380. Two laboratory periods and one seminar. Mr. SPROULL.
393. *NUCLEAR PHYSICS LABORATORY*. Fall term. Credit two hours. Prerequisite, consent of the instructor. Mr. DE WIRE.
- [396. *COSMIC RAY EXPERIMENTS*. Spring term. Credit two hours. Prerequisite, consent of the instructor. Not offered in 1951-52.]
475. *THEORETICAL MECHANICS*. Fall term. Credit three hours. Prerequisite, Physics 242 or its equivalent. Mr. BETHE.
476. *ELECTRODYNAMICS*. Spring term. Credit three hours. Prerequisite, Physics 225 or its equivalent. Mr. MORRISON.
477. *STATISTICAL MECHANICS AND KINETIC THEORY*. Fall term. Credit two hours. Prerequisites, Physics 475 and (or in parallel) Physics 485. Mr. MORRISON.
480. *THEORETICAL PHYSICS-READING COURSE*. Either term. Credit two hours. Mr. SALPETER.
485. *INTRODUCTORY QUANTUM MECHANICS*. Fall term. Credit three hours. Prerequisites, Physics 475 and 476. Mr. MORRISON.
486. *APPLICATIONS OF QUANTUM MECHANICS*. Spring term. Credit three hours. Prerequisite, Physics 485. Mr. BETHE.
491. *ADVANCED QUANTUM MECHANICS*. Fall term. Credit three hours. Prerequisite, Physics 486. Mr. DYSON. Given upon sufficient demand.
- [588. *X-RAYS*. Spring term. Credit three hours. Not offered in 1951-52.]
681. *ADVANCED ELECTRON PHYSICS*. Fall term. Credit three hours. Prerequisites, Mathematics 201, Physics 225 and 391, or their equivalents. Mr. NEWHALL.
683. *THE THEORY AND PROPERTIES OF SOLIDS*. Fall term. Credit three hours. Prerequisite, Physics 485 or its equivalent. Mr. SMITH.
692. *ADVANCED ELECTRONICS LABORATORY*. Spring term. Credit three hours. Prerequisite, Physics 681. Mr. SPROULL.
781. *NUCLEAR PHYSICS*. Fall term. Credit three hours. Prerequisites, Physics 243 and (or in parallel) Physics 485. Mr. WILSON.
782. *THEORY OF NUCLEI*. Spring term. Credit two hours. Prerequisites, Physics 485 and 781, or their equivalents. Mr. DYSON.
784. *COSMIC RAYS*. Spring term. Credit three hours. Prerequisite, a course in introductory Theoretical Physics. Mr. COCCONI or Mr. GREISEN.
- [786. *THEORY OF HIGH ENERGY PHENOMENA*. Spring term. Credit two hours. Not offered in 1951-52.]
080. *INFORMAL STUDY IN PHYSICS*. Either term. Special reading or problem work done under the direction of a member of the staff. Hours to be arranged.
090. *SPECIAL LABORATORY WORK*. Either term. Laboratory work in any branch of physics under the direction of a member of the staff. Hours to be arranged.

## PSYCHOLOGY

Mr. R. B. MacLEOD, *Chairman*; Messrs. U. BRONFENBRENNER, R. DALTON, F. S. FREEMAN, J. J. GIBSON, H. M. HARVEY, J. E. HOCHBERG, H. S. LIDDELL, K. C. MONTGOMERY, T. A. RYAN, Mrs. P. C. SMITH, Mr. A. L. WINSOR.

*For a major in Psychology, the following courses must be satisfactorily completed: (1) in Psychology, twenty-seven hours, including Psychology 101 and 112; at least three of the twenty-seven hours to be in a basic laboratory course (207, 216, 221) and at least three further hours to be in the general experimental field (207, 216, 221, 223, 224); (2) in related subjects, fifteen additional hours including Statistics, ILR 210, or equivalent, and Physiology 303 or equivalent, plus nine hours in a single related field approved by the major adviser. The following fields are recommended: Education, Mathematics, Physics, Philosophy, Sociology and Anthropology, Statistics, and Zoology.*

*Major students are advised to secure a broad background in the physical, the biological, and the social sciences, and in philosophy.*

## ELEMENTARY COURSES

\*101. *INTRODUCTION TO PSYCHOLOGY.* Either term. Credit three hours. Open to freshmen. Fall term: Lectures, T Th 9; recitation, M 9, 10, 11, F 12, S 9, or 10; lectures, T Th 11; recitation, Th 2, F 10, 12, 2, S 9 or 10; lectures, W F 10; recitation, M 10, 11, 12, T 12, 3 or S 11; or lectures, W F 11; recitation, M 9, 10, 2, T 12, 2, or S 11. Spring term: Lectures, T Th 9; recitation, M 10, F 9, 12, 2, S 10 or 11; or lectures, W F 10; recitation, M 9, 2, T 10, 11, S 10 or 11. The STAFF.

An introduction to the scientific study of behavior and experience, covering such topics as perception, motivation, emotion, learning, the higher thought processes, personality and individual differences. This course is prerequisite to further work in the Department.

\*102. *FIELDS OF PSYCHOLOGY.* Either term. Credit three hours. Prerequisite, Psychology 101. Fall term: Lectures, M W F 9; spring term: Lectures, T Th 11; recitation, F 11, 12, 2, 3, S 10 or 11. The STAFF.

A survey of methods, problems, and selected research findings in such fields as physiological, comparative, child, educational, abnormal, social, and applied psychology.

103. *EDUCATIONAL PSYCHOLOGY.* Fall term. Credit three hours. Prerequisite, Psychology 101, or Human Growth and Development, or Rural Education 10. M W F 11. Mr. FREEMAN.

The major facts and principles of psychology bearing on educational practice and theory.

106. *PSYCHOLOGY IN BUSINESS AND INDUSTRY.* Spring term. Credit three hours. Prerequisite, Psychology 101. M W F 11. Mrs. SMITH.

Applications of psychological methods in worker selection and training, conditions of efficient production, motivation in industrial performance, accident control, psychological aspects of marketing.

107. *PSYCHOLOGICAL BASIS OF SOCIAL BEHAVIOR.* Fall term. Credit three hours. Prerequisite, Psychology 101. M W F 10. Mr. —.

An introduction to the psychological study of social behavior, designed primarily for students who do not plan to do further work in social psychology.

112. *MODERN PSYCHOLOGY IN HISTORICAL PERSPECTIVE*. Spring term. Credit three hours. Prerequisite, Psychology 101. M W F 9. Mr. MacLEOD.

A systematic survey of present-day problems, methods, and points of view, considered in the perspective of their historical development. Required of all majors in psychology and recommended for students who propose to do advanced work in psychology.

### INTERMEDIATE COURSES

207. *PERCEPTION*. Fall term. Credit three hours. Prerequisites, Psychology 101, elementary statistics, and three further hours of psychology, preferably Psychology 112. Lectures, M W 12; laboratory Th 2-4. Mr. GIBSON.

An account of the ways in which the normal human adult registers and apprehends his environment. The experimental study of psychophysical correlations, of space, motion, objects, and events, and the relations of perceiving to everyday behaving and thinking.

216. *LEARNING*. Fall term. Credit three hours. Prerequisites, Psychology 101, elementary statistics, and three further hours of psychology, preferably Psychology 112. Lectures, W F 10; laboratory, T 2-4. Mr. MONTGOMERY.

The fundamental conditions and principles of learning, both animal and human. A review of selected experimental literature, with special emphasis upon recent developments in the field.

221. *MOTIVATION*. Spring term. Credit three hours. Prerequisites, Psychology 101, elementary statistics, and three further hours of psychology, preferably Psychology 112. Lectures, T Th 11; laboratory Th 2-4. Mr. HOCHBERG.

A study of the initiation, direction, and regulation of behavior. The classic problems of instinct, emotion, conflict, and will are examined in the light of evidence from current experimental, clinical, and social research.

223. *PHYSIOLOGICAL PSYCHOLOGY*. Fall term. Credit three hours. Prerequisites, Psychology 101 and three further hours of psychology, preferably Psychology 112, or consent of instructor. M W F 9. Mr. HARVEY.

Lectures and demonstrations on the physiological mechanisms of behavior with particular emphasis upon sensory processes, learning, and emotion.

224. *PSYCHOBIOLOGY*. Spring term. Credit three hours. Prerequisites, Psychology 101, Physiology 303 or equivalent, and three further hours of psychology, preferably Psychology 112. T Th S 11. Mr. LIDDELL.

The principal biological mechanisms of behavior with special reference to man. Neurophysiology, endocrinology, and conditioning in relation to the problems of human behavior.

321. *PERSONALITY THEORY*. Fall term. Credit three hours. Prerequisites, Psychology 101 and 112. T Th S 10. Mr. BRONFENBRENNER.

A critical survey of theories of personality structure, function, and development. Concrete implications of theory are examined through the analysis of case studies.

324. *SOCIAL PSYCHOLOGY*. Spring term. Credit three hours. Prerequisites, Psychology 101 plus three further hours of psychology which may not include Psychology 107. M W F 12. Mr. —.

Psychological problems and concepts basic to the social sciences, including such topics as communication, language, propaganda, social attitudes and prejudice, rivalry and cooperation, leadership and the psychology of groups.

331. *METHODS OF INDUSTRIAL SELECTION AND PLACEMENT*. Fall term. Credit three hours. Prerequisites, Psychology 101 and elementary statistics. M W F 11. Mr. RYAN.

Techniques of developing and evaluating selection and placement procedures, including such topics as development of criteria of industrial performance, analysis of reliability, methods of item analysis, validation of interviews, tests, and personal history data. It is desirable, but not required, that Psychology 351 or Rural Education 255 be taken before this course.

332. *WORK, FATIGUE AND EFFICIENCY*. Spring term. Credit three hours. Prerequisite, Psychology 101. M W F 11. Mr. RYAN.

A survey of the external and internal factors which affect the efficiency, speed, and accuracy of human work. Consideration will be given to sedentary or "mental" work as well as to physical work, in relation to fatigue, monotony, rest, sleep, and the effects of noise, light, temperature, incentives, and social factors.

336. *PSYCHOLOGICAL MARKET RESEARCH*. Spring term. Credit two hours. Prerequisites, Psychology 101 and elementary statistics. M W 9. Mrs. SMITH.

Methods of measuring the effects of advertising on consumer opinion and behavior. Psychological marketing survey methods and typical results. General problems of consumer motivation.

[342. *LEGAL PSYCHOLOGY*. Spring term. Credit three hours. Prerequisite, Psychology 101. Not given in 1951-52.]

351. *PSYCHOLOGICAL TESTS: I*. Fall term. Credit three hours. Prerequisites, Psychology 101 and elementary statistics, or consent of instructor. T Th S 9. Mr. FREEMAN.

Basic psychological principles in the construction and use of individual and group tests of intelligence and of specific aptitudes; theories of the nature of mental abilities; fields of application; intensive study of selected scales. Demonstrations in administering and interpreting individual scales.

352. *PSYCHOLOGICAL TESTS: II*. Spring term. Credit three hours. Prerequisite, Psychology 351 or consent of instructor. T Th S 9. Mr. FREEMAN.

Basic psychological principles in the construction and use of personality rating scales, personality inventories, projective techniques, and situational tests. Demonstrations.

375. *STATISTICAL METHODS IN PSYCHOLOGY*. Fall term. Credit three hours. Prerequisites, Psychology 101 and elementary statistics. M W F 2. Mr. RYAN.

An analysis of the methods for treating various kinds of psychological data. Tests of significance, correlational analysis and analysis of variance, in their application to psychological research.

## ADVANCED COURSES

401. *PSYCHOSOMATIC PROBLEMS*. Spring term. Credit three hours. Prerequisite, senior standing and consent of the instructor. M W F 9. Mr. HARVEY.

A consideration of the methodological and theoretical problems involved in psychosomatic research with particular emphasis upon the role of emotion and anxiety in physiological dysfunction.

405. *MAIN CONCEPTS OF ABNORMAL PSYCHOLOGY*. Fall term. Credit three hours. Prerequisite, nine hours of psychology or consent of the instructor. T Th S 11. Mr. LIDDELL.

Examination of basic concepts from biology, psychology, and sociology currently employed in the analysis and interpretation of abnormal behavior.

410. *INDIVIDUAL DIFFERENCES*. Spring term. Credit three hours. Prerequisite, Psychology 351. T Th 2-3:15. Mr. FREEMAN.

The nature, causes, and implications of individual differences in human abilities and behavior. Study of atypical groups.

411. *PROCEDURES IN CLINICAL CHILD PSYCHOLOGY*. Spring term. Credit three hours. Prerequisite, Psychology 351. Primarily for seniors and graduate students. M 4-6, and conferences to be arranged. Mr. FREEMAN.

Procedures and instruments used with clinical cases involving problems of learning and of behavioral adjustment.

422. *COMPARATIVE PSYCHOLOGY*. Spring term. Credit three hours. Prerequisites, six hours of psychology and consent of instructor. Lectures, M F 10; laboratory, W 2-4. Mr. MONTGOMERY.

A systematic study of the phylogenetic development of the basic psychological functions and their underlying mechanisms.

426. *EXPERIMENTAL PSYCHOPATHOLOGY*. Spring term. Credit three hours. Prerequisites, Psychology 405 and consent of instructor. Lectures M W 11, laboratory hour to be arranged. Mr. HARVEY.

The application of experimental methods to the behavior disorders; analysis of contemporary theories of behavior pathology; laboratory work in experimental neuroses.

[432. *PSYCHOLOGY OF LANGUAGE AND THINKING*. Spring term. Credit three hours. Prerequisites, Psychology 101 and 112. Mr. MACLEOD.

An approach to the psychological study of thinking through the analysis of the processes of communication. Material will be drawn from studies of linguistic development, from the pathology of language, from comparative linguistics, and from experimental studies of language and thinking. The course is designed for students of philosophy, language, and literature as well as for students of psychology. Not given in 1951-52.]

455. *ADVANCED INDUSTRIAL PSYCHOLOGY*. Fall term. Credit two hours. Prerequisites, Psychology 331 and 332. Primarily for majors planning to work in industry. W F 12. Mrs. SMITH.

Interviewing methods, morale surveys, job analysis, selection of supervisory and executive personnel, employee counseling, training techniques for workers, supervisors, and executives, record keeping and analysis.



456. *RESEARCH METHODS IN INDUSTRIAL PSYCHOLOGY*. Spring term. Credit three hours. Prerequisites, Psychology 331, 332, and consent of instructor. M 2 and laboratory hours to be arranged. Mrs. SMITH.

An introduction to research techniques in industrial psychology. Industrial and laboratory exercises in test construction, analysis of reliability and validity of test and interview methods, studies of fatigue, learning and job analysis programs.

476. *TECHNIQUE OF EXPERIMENTATION*. Spring term. Credit three hours. Prerequisite, senior standing and consent of instructor. T 2-4. Laboratory hours to be arranged. Mr. HOCHBERG.

An advanced course in experimental psychology, stressing the methods of planning and executing experiments. The group will plan and conduct experiments on selected problems. Recommended for students who plan to do graduate work in psychology and for major students in related sciences.

485. *CONTEMPORARY PSYCHOLOGICAL THEORY*. Fall term. Credit three hours. Prerequisites, Psychology 101, 112, and at least three further hours of psychology. Open to all qualified students and strongly recommended as a senior course for those who plan to do graduate work in psychology. M W F 11. Mr. HOCHBERG.

A survey of the main theoretical trends—behavioristic, Gestaltist, Freudian, etc.—in contemporary psychology, with a detailed examination of representative problems as they are approached from these different points of view. Together with Psychology 112 this course provides an orientation in the history of psychology and systematic psychology.

531. *HISTORY OF PSYCHOLOGY*. Either term. Credit three hours.

499. *MINOR RESEARCH PROBLEMS*. Either term. Credit three hours. Prerequisite, consent of the instructor. Hours to be arranged. The STAFF.

Research in general, abnormal, animal, industrial, physiological and social psychology, and in experimental psychopathology. The course is designed for students majoring in psychology who are prepared to undertake original investigations.

050. *INFORMAL STUDY*. Either term. Credit one, two, or three hours. The STAFF.

## GRADUATE SEMINARS

Primarily for graduate students, but with the consent of the instructor may be taken by qualified undergraduates. Approximately five seminars will be offered each term, the selection to be determined by the needs of the students. During the pre-registration period, the list of seminars for the following term will be posted, specifying instructors, topics to be covered, and hours of meeting.

511. *PERCEPTION*. Either term. Credit three hours.

513. *LEARNING*. Either term. Credit three hours.

515. *MOTIVATION*. Either term. Credit three hours.

517. *THINKING*. Either term. Credit three hours.

521. *PSYCHOBIOLOGY*. Either term. Credit three hours.

523. *PSYCHOPHYSIOLOGY*. Either term. Credit three hours.

531. *HISTORY OF PSYCHOLOGY*. Either term. Credit three hours.

541. *STATISTICAL METHODS*. Either term. Credit three hours.
543. *CLINICAL METHODS*. Either term. Credit three hours.
545. *METHODS OF SOCIAL ANALYSIS*. Either term. Credit three hours.
547. *METHODS OF CHILD STUDY*. Either term. Credit three hours.
562. *HUMAN DEVELOPMENT AND BEHAVIOR*. Fall term. Credit three hours.
571. *SOCIAL PSYCHOLOGY*. Either term. Credit three hours.
573. *PERSONALITY, NORMAL AND ABNORMAL*. Either term. Credit three hours.
581. *INDUSTRIAL PSYCHOLOGY*. Either term. Credit three hours.
591. *EDUCATIONAL PSYCHOLOGY*. Either term. Credit three hours.
600. *THE TEACHING OF PSYCHOLOGY*. Spring term. Credit three hours.

## SOCIOLOGY AND ANTHROPOLOGY

Mr. LAURISTON SHARP, *Chairman*; Messrs. J. J. ADAIR, M. L. BARRON, L. S. COTTRELL, JR., J. P. DEAN, N. N. FOOTE, A. R. HOLMBERG, A. H. LEIGHTON, M. E. OPLER, G. F. STREIB, E. A. SUCHMAN, R. M. WILLIAMS, JR.

*For a major in Sociology and Anthropology, the following courses must be completed: (1) twenty-four hours in Sociology and Anthropology in addition to Sociology and Anthropology 101 or 103; (2) twenty-one hours in related subjects to be chosen with the approval of the adviser. All students majoring in this department must satisfactorily complete Industrial and Labor Relations 210 and Sociology and Anthropology 201 and 202.*

*Students intending to pursue advanced work in Sociology and Anthropology, or desiring information concerning particular sequences of courses leading to graduate study or to careers within these fields, should consult a special bulletin issued by the Department.*

### GENERAL COURSES

\*101. *INTRODUCTION TO THE STUDY OF SOCIETY*. Either term. Credit three hours. Open to all students although primarily intended for freshmen. M W F 8, 10, 12, or 2; T Th S 8, 10, 11. Messrs. BARRON, FOOTE, and STAFF.

An introduction to the study of societies as interrelated systems; selected major problems of contemporary American society as seen in the context of our own social system; social factors in personality formation.

\*103. *MAN AND CULTURE: AN INTRODUCTION TO ANTHROPOLOGY*. Fall term. Credit three hours. Open to freshmen and sophomores, upperclassmen admitted only by permission of the instructor. M W F 9. Mr. ADAIR.

A broad survey of the field of anthropology. Major emphasis on social anthropology. Topics include: organization of cultural systems, culture change, and problems of cultural integration.

\*104. *CONTEMPORARY SOCIAL PROBLEMS*. Spring term. Credit three hours. Prerequisite, Sociology and Anthropology 101 or 103, or consent of the instructor. Open to freshmen. T Th S 11. Mr. BARRON.

Major social problems of modern urban society viewed in terms of the factors underlying social disorganization and individual maladjustment.

## RESEARCH METHODS AND THEORY

201. *INTRODUCTION TO RESEARCH METHODS*. Fall term. Credit three hours. Prerequisite, Sociology and Anthropology 101 or 103, or consent of instructor. Not open to freshmen. M W F 10. Mr. SUCHMAN.

Problems of research design and techniques for gathering data in sociological research.

202. *ANALYSIS AND INTERPRETATION OF SOCIAL DATA*. Spring term. Credit three hours. Prerequisite, Industrial and Labor Relations 210 or the equivalent. Not open to freshmen. M W F 10. Mr. SUCHMAN.

The application of simple statistical techniques to the analysis of social data. Interpretation of evidence and consideration of sources of error and of bias.

231. *SOCIAL THEORY AS APPLIED TO RESEARCH*. Fall term. Credit three hours. Open to upperclassmen and graduate students. M W F 10. Mr. —.

Social theory treated as a series of interlocking decisions. Theorizing viewed as operational behavior in its application to empirical research. The course is based on intensive case studies of the theoretic framework of sociological and social-psychological monographs.

242. *FUNCTIONAL ANALYSIS OF SOCIAL STRUCTURES*. Spring term. Credit three hours. Open to upperclassmen and graduate students. M W F 10. Mr. —.

An introduction to structural and functional analysis in sociology, viewed as a guide to the selection of substantive concepts in the study of social organizations. Theoretical background and basic postulates of functional analysis. Case studies of social structure and the patterning of sentiments and emotions. Structural sources of deviant behavior.

[275-276. *SEMINAR: RESEARCH METHODS IN SOCIOLOGY AND ANTHROPOLOGY*. Throughout the year. Credit two hours a term. Open to upperclass majors and graduate students in sociology and anthropology. Mr. HOLMBERG and STAFF. Not given in 1951-52.]

277. *SEMINAR: CURRENT RESEARCH PROJECTS*. Throughout the year. Credit two hours a term. Prerequisite, consent of instructor. W 4-6. STAFF.

875. *THEORY OF CULTURE AND SOCIAL ORGANIZATION*. Fall term. Credit three hours. Open to seniors and graduate students with the consent of the instructor. T Th S 11. Mr. WILLIAMS.

Analysis of convergence in modern sociological thought. Includes consideration of sociological elements of major recent theories in related fields. The works of a number of the more important modern social scientists will be analyzed in developing a consistent theoretical framework.

## SOCIAL PSYCHOLOGY

301. *SOCIAL PSYCHOLOGY: INTERPERSONAL BEHAVIOR*. Fall term. Credit three hours. Prerequisite, one course in sociology and anthropology and one course in psychology. M W F 9. Mr. FOOTE.

Social psychological analysis of the processes and products of personal interaction.

302. *SOCIAL PSYCHOLOGY: GROUP DYNAMICS*. Spring term. Credit three hours. Prerequisite, one course in sociology and anthropology and one course in psychology. Not open to freshmen. M W F 9. Two-hour laboratory, W or Th afternoon, to be arranged. Mr. FOOTE.

Social psychological analysis of the processes and products of intra- and intergroup behavior.

310. *THE FAMILY*. Spring term. Credit three hours. Prerequisite, Sociology and Anthropology 101 or 103, or consent of instructor. Not open to freshmen. M W F 8. Mr. STREIB.

Analysis of the family from the standpoint of sociological theory; the family in relation to other institutions; social change and the family; social psychology of family relationships; the family as a type of primary group.

311. *PUBLIC OPINION*. Fall term. Credit three hours. No prerequisites. Not open to freshmen. M W F 11. Mr. SUCHMAN.

The nature and control of public opinion, including opinion formation and change. A study of the methods and techniques of public opinion and attitude analysis.

312. *MASS COMMUNICATION MEDIA*. Spring term. Credit three hours. No prerequisites. Not open to freshmen. M W F 11. Mr. ———.

This course deals with the nature of the mass media of communication—news-papers, radio, movies, magazines, books, and comics—and their effects upon public opinions and attitudes. It will analyze the structure and control, audience, content, effects, and social functions of the mass media.

[314. *COLLECTIVE BEHAVIOR AND SOCIAL MOVEMENTS*. Spring term. Credit three hours. Prerequisite, Sociology and Anthropology 101 or 103 or consent of instructor. Not open to freshmen. Not given in 1951-52.]

320. *POLITICAL SOCIOLOGY*. Fall term. Credit three hours. Prerequisites, Sociology and Anthropology 101 or 103, or consent of instructor. Not open to freshmen. T Th S 11. Mr. ———.

This course deals with the study of political institutions as sociological phenomena. Politics as a democratic and functional instrument will be examined. The relation between power and politics, as well as forms of political power, will be analyzed. Sources of political apathy and bureaucracy as an organizational phenomenon will be discussed.

*HUMAN RELATIONS IN INDUSTRY*. (See Industrial and Labor Relations 220.)

*PRINCIPLES OF HUMAN RELATIONS*. (See Industrial and Labor Relations 320.)

375. *SEMINAR: SOCIAL PSYCHOLOGY*. Spring term. Credit two hours. Prerequisite, Sociology and Anthropology 301 or 302. Hours to be arranged. Mr. COTTRELL.

[376. *SEMINAR: PROPAGANDA*. Spring term. Credit two hours. Mr. SUCHMAN. Not given in 1951-52.]

385. *SEMINAR: GROUP RELATIONS*. Spring term. Credit two hours. Prerequisite, consent of instructor. T 2-4. Mr. WILLIAMS.

### AMERICAN SOCIETY

431. *STRUCTURE AND FUNCTIONING OF AMERICAN SOCIETY—I*. Fall term. Credit three hours. Prerequisite, Sociology and Anthropology 101 or 103, or consent of instructor. Not open to freshmen. T Th S 9. Mr. WILLIAMS.

Institutional structure and social organization of the United States.

432. *STRUCTURE AND FUNCTIONING OF AMERICAN SOCIETY—II*. Spring term. Credit three hours. Prerequisite, Sociology and Anthropology 431 or consent of instructor. Not open to freshmen. T Th S 9. Mr. WILLIAMS.

Analysis of the functional interrelations of groups and institutions in American society.

433. *AMERICAN ECONOMIC CLASSES*. Fall term. Credit three hours. Open to upperclassmen and graduate students. T Th S 8. Mr. FOOTE.

A sociological analysis of the specific nature of American economic classes and their interrelations.

435. *AMERICAN COMMUNITIES*. Spring term. Credit three hours. Prerequisite, Sociology and Anthropology 101 or 103, or consent of instructor. M W F 2. Mr. STREIB.

An analysis of certain selected sociological problems from the standpoint of the community. Emphasis will be placed upon the urban community, its historical development, growth in modern times, ecological setting, and social stratification.

[477-478. *SEMINAR: THE URBAN COMMUNITY*. Throughout the year. Credit two hours a term. Prerequisite, consent of instructor. Mr. DEAN. Not given in 1951-52.]

[485. *SEMINAR: FOREIGN INTERPRETATIONS OF AMERICAN SOCIETY*. Fall term. Credit two hours. Prerequisite, consent of instructor. Mr. BARRON. Not given in 1951-52.]

### SOCIAL PROBLEMS AND PLANNING

[510. *POPULATION PROBLEMS*. Fall term. Credit three hours. Prerequisite, Sociology and Anthropology 101 or 103, or consent of instructor. Mr. BARRON. Not given in 1951-52.]

520. *PROBLEMS IN MINORITY GROUP RELATIONS*. Spring term. Credit three hours. Prerequisite, Sociology and Anthropology 101 or 103, or consent of instructor. Not open to freshmen. T Th S 10. Mr. BARRON.

The old-world background of American minorities and patterns of immigration; critical analysis of minorities' contributions to American culture. Relations of ethnic institutions and American legislation to adjustment and assimilation. Problems of second-generation Americans.

530. *DELINQUENCY AND CRIME*. Fall term. Credit three hours. Prerequisite, Sociology and Anthropology 101 or 103, or consent of instructor. T Th S 10. Mr. BARRON.

Comparison of juvenile delinquency and adult crime with special reference to the United States. Analysis of statistics on offenses and offenders; historical development of criminological theory; recent etiologic trends; laws and court systems; police and penology; techniques of treatment and prevention.



550. *SOCIAL PLANNING*. Spring term. Credit three hours. Open to upperclassmen and graduate students. T Th S 8. Mr. FOOTE.

A survey of objectives, methods, and problems in social planning with special attention to community participation in the planning process.

576. *SEMINAR: SOCIAL CHANGE AND SOCIAL PLANNING*. Spring term. Credit two hours. Prerequisite, consent of instructor. Th 2-4. Mr. FOOTE.

[585. *SEMINAR: PROBLEMS OF OLD AGE*. Fall term. Credit two hours. Prerequisite, consent of instructor. Mr. BARRON. Not given in 1951-52.]

### CULTURAL ANTHROPOLOGY

[603. *NATIVE CULTURES OF THE NEW WORLD: NORTH AMERICA*. Fall term. Credit three hours. Mr. ADAIR. Not given in 1951-52.]

[604. *NATIVE CULTURES OF THE NEW WORLD: MIDDLE AND SOUTH AMERICA*. Spring term. Credit three hours. Mr. HOLMBERG. Not given in 1951-52.]

[605. *NATIVE CULTURES OF THE PACIFIC*. Spring term. Credit two hours. Mr. SHARP. Not given in 1951-52.]

*INTRODUCTION TO CONTEMPORARY CHINA*. (See Far Eastern Studies 201.)

*INTRODUCTION TO CONTEMPORARY SOUTHEAST ASIA*. (See Far Eastern Studies 202.)

[*INTRODUCTION TO CONTEMPORARY INDIA*. (See Far Eastern Studies 206.)]

[*PHYSICAL ANTHROPOLOGY AND HUMAN EVOLUTION*. (See Zoology 222.) Not given in 1951-52.]

609. *THE DEVELOPMENT OF CULTURE: AN INTRODUCTION TO ARCHAEOLOGY*. Fall term. Credit three hours. Open to upperclassmen and graduate students. M W F 2. Mr. ADAIR.

A review of prehistoric culture sequences in several world areas. Analysis and appraisal of archaeological methods of cultural study.

611. *CULTURAL ANTHROPOLOGY*. Fall term. Credit three hours. Open to upperclassmen and graduate students. M W F 12. Mr. OPLER.

Problems in the comparative study of cultures; the component parts of culture and their interrelations; analysis of processes involved in the impact of cultures on each other and in change.

612. *CULTURE AND PERSONALITY*. Spring term. Credit three hours. Open to upperclassmen and graduate students. M W F 12. Mr. OPLER.

A comparative study of personality formation in different cultures; behavior, both normal and abnormal, as a function of cultural determinants; the problem of type or group personality structure.

616. *SOCIAL SOURCES OF PSYCHOLOGICAL STRESS*. Spring term. Credit three hours. Prerequisite, Sociology and Anthropology 101 or 103 and one course in psychology, or consent of instructor. M W F 2. Mr. —.

An examination of factors in the social and cultural environment which produce strains capable of causing psychological disorder. A number of cultures are examined.

*INTRODUCTION TO THE SCIENTIFIC STUDY OF LANGUAGE.* (See Linguistics 201-202.)

620. *COMPARATIVE SOCIAL AND POLITICAL ORGANIZATION.* Spring term. Credit three hours. Prerequisite, Sociology and Anthropology 611 or 431. M W F 11. Mr. —.

The varied organization of human relations in selected cultures, both simple and complex; case studies of territorial, familial, clique, club, class, caste, and other bases of association and interaction; the definition and evaluation by comparison and contrast of democratic and other forms of group initiative and control.

[622. *COMPARATIVE RELIGIOUS SYSTEMS OF NON-WESTERN PEOPLES.* Fall term. Credit three hours. Mr. OPLER. Not given in 1951-52.]

[624. *COMPARATIVE ECONOMIC SYSTEMS OF NON-WESTERN PEOPLES.* Spring term. Credit three hours. Mr. HOLMBERG. Not given in 1951-52.]

[*PRIMITIVE ART: THE ART OF EARLY SOCIETIES.* (See Fine Arts 204.) Not given in 1951-52.]

[626. *THE ARTS OF NONLITERATE MAN.* Spring term. Credit three hours. Mr. ADAIR. Not given in 1951-52.]

[*SEMINAR: LANGUAGE AND CULTURE.* (See Linguistics 290.) Not given in 1951-52.]

[675. *SEMINAR: ANTHROPOLOGICAL THEORY.* Spring term. Credit two hours. Mr. OPLER. Not given in 1951-52.]

677. *SEMINAR: CULTURE AND CULTURE CHANGE IN NORTHEAST AMERICA.* Fall term. Credit two hours. Prerequisite, consent of instructor. T 10-12. Mr. LEIGHTON.

[681. *SEMINAR: CULTURE AND CULTURE CHANGE IN MIDDLE AND SOUTH AMERICA.* Spring term. Credit two hours. Mr. HOLMBERG. Not given in 1951-52.]

683. *SEMINAR: CULTURE AND CULTURE CHANGE IN INDIA.* Fall term. Credit two hours. T 4-6. Mr. OPLER.

685. *SEMINAR: CULTURE AND CULTURE CHANGE IN SOUTHEAST ASIA.* Spring term. Credit two hours. Th 4-6. Mr. SHARP.

687. *SEMINAR: REGIONAL ANTHROPOLOGY.* Throughout the year. Credit to be arranged. Far East: Messrs. LEIGHTON, OPLER, and SHARP; Middle East: Messrs. OPLER and SHARP; North America: Messrs. ADAIR, LEIGHTON and OPLER; Middle and South America: Mr. HOLMBERG; Oceania: Mr. SHARP; Africa: Messrs. HOLMBERG and SHARP.

For students who wish to acquire special competence in the anthropology of a recognized culture area or principal region of the world.

689. *SEMINAR: SPECIAL PROBLEMS IN ANTHROPOLOGY.* Throughout the year. Credit to be arranged. STAFF.

For students who require thesis supervision or guidance in the study of special anthropological problems or who are doing intensive reading in special fields of anthropology such as archaeology. Consult appropriate staff members.

690-691. *SEMINAR: CASE STUDIES IN APPLIED ANTHROPOLOGY*. Both terms or either term. Credit two hours a term. Prerequisite, consent of instructor. M 7:30-9:30 P.M. Mr. ADAIR and STAFF.

Designed for students in engineering, agriculture, nutrition, and the social sciences who are concerned with the modernization of underdeveloped regions of the world. Analysis of selected cases relating to human problems resulting from technological or other cultural change.

692. *SEMINAR: FIELD LABORATORY IN APPLIED ANTHROPOLOGY*. Summer. Credit five hours. Prerequisite, consent of instructors. Messrs. LEIGHTON and ADAIR.

Summer field training in New Mexico and Arizona for students in both the technical and social sciences. Research related to human problems resulting from technological change. Selected ethnic groups will be studied.

020. *INFORMAL STUDY*. Throughout the year. Credit and hours to be arranged. Open to upperclass major and graduate students in Sociology and Anthropology. Members of the Department STAFF.

## SPEECH AND DRAMA

Mr. H. D. ALBRIGHT, *Chairman*; Messrs. C. S. ANGELL, C. C. ARNOLD, A. M. DRUMMOND, H. V. GOULD, S. J. SAVEREID, W. H. STANTON, C. K. THOMAS, H. A. WICHELS.

*Students may elect a general major, or a major with emphasis on (1) Rhetoric and Public Speaking, (2) Phonetics and Speech Training, (3) Dramatic Production. The following courses must be completed: (1) in the Department, twenty-one hours including nine hours from Courses 101, 102, 111 (or 141), 333; (2) in related subjects, six hours of courses not taken in the freshman year in each of the following groups: (a) English; (b) Economics, History, Government, Sociology; (c) Philosophy. Of this total of thirty-nine hours, twenty-four must be in other than introductory courses.*

*Students planning to teach Speech should satisfy the basic requirements for teachers of English. For those preparing to teach English, the Department recommends fifteen to eighteen hours in Speech and Drama including Courses 101, 111 (or 141), 333, 401.*

## INTRODUCTORY COURSES

101. *PUBLIC SPEAKING*. Either term. Credit three hours. Not open to freshmen or to students who have taken Speech and Drama 103 or 105. M W F 8, 9, 10, 11, or 12; T Th S 8, 9, 10, or 11. Messrs. ANGELL, ARNOLD, SAVEREID, WICHELS, and assistants.

Practice in speaking on subjects of current interest; methods of preparation and delivery; various types of speech experience, such as exposition, advocacy, reading aloud, discussion, and chairmanship; study of principles and of examples; conferences.

Foreign students and others whose pronunciation of English falls below the normal standard, and students with special vocal problems, are advised to confer with Mr. THOMAS before registering.

102. *PUBLIC SPEAKING*. Either term. Credit three hours. Prerequisite, Speech and

Drama 101 or 105. Fall term: M W F 11; Mr. WICHELS. Spring term, M W F 11 or 12; Mr. ANGELL and Mr. WICHELS.

Study of interest, persuasion, and psychology of the audience as problems of speechmaking; experience in various form of public address; conferences.

111. *ORAL INTERPRETATION OF LITERATURE*. Spring term. Credit three hours. Not open to freshmen or to students who have taken Speech and Drama 141. M W F 12. Mr. GOULD.

Study, for understanding and appreciation, of poetry and prose selected from the best English and American writers; practice in reading aloud; conferences; drill.

\*131. *VOICE TRAINING*. Spring term. Credit two hours. Open to freshmen. Consult the instructor before registering. T Th 12. Mr. THOMAS.

An elementary course for the improvement of the speaking voice. Individual and group practice in the overcoming of such faults as nasality, weak quality, and indistinctness. Attention to the principles of voice production. Students with special vocal problems are advised to take this course before Course 101.

\*133. *TRAINING FOR STUTTERERS*. Fall term. Credit two hours. Open to freshmen. T Th 12. Mr. THOMAS.

The nature of the problem; remedial treatment; conferences.

141. *DRAMATIC INTERPRETATION*. Fall term. Credit three hours. Not open to freshmen or to students who have taken Speech and Drama 111. Prerequisite, consent of the instructor. T Th S 10. Mr. ALBRIGHT.

Analysis and interpretative reading of various types of dramatic prose and poetry; principles of stage presentation; reports, individual exercises, and group rehearsal.

[175. *ART OF THE THEATRE*. Not offered in 1951-52.]

## PUBLIC SPEAKING: ORAL READING

205. *DISCUSSION*. Either term. Credit three hours. Open to sophomores and upper-classmen; not open to students who have taken Speech 103. Fall term: M W F 10; Mr. ARNOLD. Spring term: M W F 10 or T Th S 10; Mr. ARNOLD and Mr. SAVEREID.

Study of the principles of systematic investigation and reflective thinking as applied to discussion. Practice in discussion of current problems by use of the various forms: round-table, panel, dialogue, case conference, committee, parliamentary, and lecture-forum.

[209. *ORAL INTERPRETATION OF LITERATURE*. Not offered in 1951-52.]

213. *ARGUMENT*. Either term. Credit three hours. Prerequisite, Speech and Drama 101, or consent of the instructor. M W F 10. Fall term, Mr. WICHELS. Spring term, Mr. ANGELL.

Practice in the construction and presentation of argumentative speeches on contemporary public questions; study of the principles of evidence and reasoning as applied in public debate: analysis of issues, modes of proof, methods of refutation; attention to structure and style in speech composition and to delivery; conferences.

214. *ARGUMENT*. Spring term. Credit three hours. Prerequisite, Speech and Drama 213. M W F 10. Mr. WICHELS.

A continuation of Speech and Drama 213; practice in forensic and parliamentary debate, and in cross-examination; advanced study of methods and types of argument; conferences.

221. *FORMS OF PUBLIC ADDRESS*. Fall term. Credit three hours. Open by consent of the instructor to juniors and seniors who have had one course in public speaking. T Th S 11. Mr. ARNOLD.

Study of legislative, legal, ceremonial, campaign, and sermonic addresses. Critical examination of speeches by Burke, Whitefield, Erskine, Webster, Lincoln, Darrow, Roosevelt, and outstanding living speakers. Some practice in speech composition.

241. *PUBLIC OPINION AND THE METHOD OF ARGUMENT*. Spring term. Credit three hours. Not open to freshmen. T Th S 11. Mr. ARNOLD.

Critical study of the methods of persuasion exemplified in the discussion of contemporary issues. Lectures, readings, and reports on the theory of persuasion, the available grounds for argument and appeal in modern society, and the patterns of argument exemplified in current debates; some practice in speech writing.

[275-276. *HISTORY OF PUBLIC ADDRESS*. Not offered in 1951-52.]

281-282. *BRITISH ORATORS*. Throughout the year. Credit three hours a term. Open to upperclassmen by consent of the instructor. T 2-4:30. Mr. WICHELNS.

A study of leading British orators from the sixteenth century to the present, with emphasis on Burke and his contemporaries. Lectures, readings, and reports.

[283-284. *AMERICAN ORATORS*. Not offered in 1951-52.]

[287-288. *THEORIES OF PUBLIC ADDRESS*. Not offered in 1951-52.]

*The Department calls attention to three prizes in Public Speaking, competition for which will be open in the spring term: The Woodford Prize, for seniors; the Class of 1894 Memorial Prize in Debate, for juniors and seniors; and the Class of 1886 Memorial Prize in Public Speaking, for sophomores and juniors.*

## SPEECH TRAINING AND PHONETICS

333. *ENGLISH PHONETICS*. Fall term. Credit three hours. Not open to freshmen. M W F 12. Mr. THOMAS.

Principles of phonetics; study of English pronunciation, based chiefly on contemporary American usage; practice in phonetic analysis, and, where necessary, drill for the improvement of individual speech.

[334. *PRINCIPLES OF PHONETICS*. Not offered in 1951-52.]

336. *REGIONAL AND HISTORICAL PHONETICS*. Spring term. Credit three hours. Prerequisite, Speech and Drama 333. M W F 12. Mr. THOMAS.

The major varieties of American pronunciation and their development.

351-352. *PRINCIPLES OF SPEECH CORRECTION*. Throughout the year. Credit three hours a term. T Th S 9. Mr. THOMAS.

Study of principles and methods, correlated with supervised practice in the Speech Clinic.

*SPEECH CLINIC*. For students working under the direction of the Department. Consult Mr. THOMAS.



## DRAMATIC PRODUCTION

*DRAMA AND THEATRE.* (See Literature 301-302.)

401. *DRAMATIC PRODUCTION: DIRECTION.* Fall term. Credit three hours. For upperclassmen and graduates. M W F 11. Mr. STANTON.

Theory of stage direction; fundamentals of theatrical mounting; survey of practical phases of production. Lectures, exercises, and reports. Prerequisite for further work in dramatic production.

405. *ADVANCED DRAMATIC PRODUCTION: DIRECTION.* Fall term. Credit three hours. Open to upperclassmen by consent of the instructor. T 2-4 and an hour to be arranged. Mr. STANTON.

Readings, reports, and exercises in the direction and production of plays.

421. *ADVANCED DRAMATIC INTERPRETATION.* Spring term. Credit three hours. For graduates and, by consent of the instructor, for upperclassmen majoring in the Department. W 2-4:30. Mr. ALBRIGHT.

Varied projects in acting and group rehearsal, leading to public presentations by the Laboratory Players; individual drills, pantomimes, and reading exercises.

431. *DRAMATIC PRODUCTION: STAGECRAFT.* Spring term. Credit three hours. Prerequisite, consent of the instructor. Open to upperclassmen. M W 11 and T 2-4:30. Mr. STANTON.

The theory and practice of stage production; planning of small theatres; stage arrangement; problems and practice in scene construction, design, and elements of lighting. Lectures, demonstrations, reports.

433-434. *THEATRE PRACTICE.* Throughout the year. Credit two hours a term. Open by consent of the instructor to upperclassmen who have taken or who are taking Speech and Drama 141 or 401. Hours to be arranged. Messrs. STANTON, ALBRIGHT, and the STAFF of the University Theatre.

Projects in the productions of the University Theatre.

437. *DRAMATIC PRODUCTION: STAGE LIGHTING.* Spring term. Credit three hours. T Th 12. Laboratory, Th 2-4:30. Mr. STANTON.

Light and color applied to theatrical production. Lectures, laboratory exercises, and reports.

451. *HISTORY OF THE THEATRE.* Spring term. Credit three hours. Open to upperclassmen. M W F 10. Mr. DRUMMOND.

The development of the theatre, with special attention to the period theatres and theatrical styles which influence modern stage presentation.

455. *AMERICAN DRAMA AND THEATRE.* Fall term. Credit three hours. Open to upperclassmen. M W F 10. Mr. DRUMMOND.

A study of the American theatre and of the principal American plays, with emphasis on the drama as an experience of the national life and culture.

461-462. *PLAYWRITING.* Throughout the year. Credit three hours a term. F 2-4:30. Mr. DRUMMOND.

Dramatic theory and practice; four one-act plays will be written each term.

475. *THEORIES OF DRAMATIC PRODUCTION.* Fall term. Credit three hours.

Primarily for graduates; open to seniors by consent of the instructor. W 2-4:30. Mr. DRUMMOND.

The chief theories of dramatic production in relation to aesthetic principles.

*The Department calls the attention of students interested in Dramatic Production to the following courses: those listed under the Fine Arts; English 345 and 369-370; History of Costume (in the College of Home Economics); Arts of Design (in the College of Architecture).*

*Three prizes in playwriting are offered under the auspices of the Department in 1951-52: the Heermans Prize for One-Act Plays on an American Theme; the University Theatre Prize for New York State Regional Plays (open to graduates and undergraduates); and the Cornell Dramatic Club Prize (no restriction as to theme).*

## ZOOLOGY

Mr. H. B. ADELMANN, *Chairman*; Messrs. L. C. COLE, P. W. GILBERT, D. R. GRIFFIN, S. L. LEONARD, J. W. PAPEZ, W. A. WIMSATT, B. P. YOUNG.

*For a major in Zoology there must be completed: (1) Zoology 101-102, or 103-104, and eighteen other hours selected from Zoology 211-212, 222, 301, 302, 304, 401-402, 404, 451, 452, 515-516, Conservation 8, and Physiology 303; and (2) fifteen hours in related fields, selected from courses in Bacteriology, Chemistry, Biochemistry, Botany, Conservation, Entomology, Geology, Physics, Human Physiology, or Plant Breeding 101.*

*Introductory zoology (Zoology 101-102), or general zoology (Zoology 103-104), or an equivalent course is a prerequisite for all courses in the Department.*

*Provisions are made for a limited number of students to undertake informal study.*

*Choice of all courses should be made in conference with the student's adviser.*

*Students who are planning to study medicine should make sure that they select a major that will include the entrance requirements of the medical school of their choice. Information as to advisers and the entrance requirements of medical schools may be obtained at the office of Professor L. L. BARNES, Rockefeller 155.*

**\*101-102. INTRODUCTORY ZOOLOGY.** Throughout the year. Credit three hours a term. If taken after Biology 1, credit two hours a term. Intended for students in Arts and Sciences. Zoology 101 prerequisite to Zoology 102. Lectures, T Th 9 or 12, Stimson G-25. Laboratory, M T W Th or F 2-4:20; T or F 10-12:20; or S 9-11:20. Stimson 104 and 116. Mr. YOUNG and assistants.

During the first term comparisons are made of the structure and body functions of suitable laboratory animals with those of man. Also fundamental biological principles are presented which contribute to the student's understanding of himself and the world in which he lives.

The second term includes a systematic survey of the structures, functions, and life activities of representative types of animals from protozoans to man. The economic importance of animals to mankind and the origin and relationship of man to other animals are emphasized.

**\*103-104. GENERAL ZOOLOGY.** Throughout the year. Credit three hours a term. If taken after Biology 1, credit two hours a term. Intended for students in Agriculture and Home Economics. Lectures, T Th 8 or 11. Laboratory, M T W Th or F 2-4:20; M 10-12:20; or S 9-11:20. Mr. LEONARD and assistants.

This course will survey the various branches of the zoological sciences to serve as a background for advanced work in the study of animals.

The principles of zoology will be illustrated by the study of representative animals with emphasis on those of economic importance to agriculture and to man. Emphasis will be placed on the biology of the vertebrates including the structural, functional, developmental, and genetic aspects.

211-212. *COMPARATIVE ANATOMY OF VERTEBRATES*. Throughout the year. Credit three hours a term. Prerequisite, Zoology 101-102, or 103-104, or the equivalent. Lecture, M 8 or 9. Laboratory, M F or T Th 2-4:30; W F or T Th 8-10:30; or W 2-4:30 and S 8-10:30. Mr. GILBERT and assistants.

A thorough study and dissection of representative vertebrate types, including fish, amphibian, reptile, bird, and mammal, together with demonstrations on species other than the types dissected. The course is intended to give students an evolutionary background for the study and appreciation of the structure of higher vertebrates, including man.

[222. *PHYSICAL ANTHROPOLOGY AND HUMAN EVOLUTION*. Spring term. Credit three hours. Lectures, M W F 12. Not offered in 1951-52.]

Eras of vertebrate evolution, with special reference to the primates; prehistoric man; physical anthropology; and modern races and peoples.

[224. *COMPARATIVE NEUROLOGY*. Spring term. Credit three hours. Prerequisite, nine hours of Zoology. Lectures, T Th 12. Laboratory, M or W 2-4:30. Not offered in 1951-52.

A comparative study of the vertebrate nervous system based on dissections of brains of dog and man and sections of primate brain stem; study of the neural mechanisms that determine the receptive, motor, and autonomic functions of the nervous system.]

301. *HISTOLOGY: THE BIOLOGY AND DEVELOPMENT OF THE TISSUES*. Fall term. Credit four hours. Prerequisite, Zoology 101-102, or 103-104, and 211-212. Lectures, T Th 11. Laboratory, T Th 8-10:30 or 2-4:30. Mr. WIMSATT and assistants.

A general survey of the structure and development of the tissues. The treatment is general, designed to provide students of biology with a basis for the understanding of normal and abnormal structure of the vertebrates. Each student will make for his own use a series of typical microscopic preparations.

302. *SPECIAL HISTOLOGY: THE BIOLOGY OF THE ORGANS*. Spring term. Credit four hours. Prerequisite, Zoology 301. Lectures, W F 9. Laboratory, W F 2-4:30. Mr. WIMSATT and assistants.

A continuation of Zoology 301. Zoology 301 and 302 together give the fundamental facts of the microscopic structure and development of the body. There is also offered opportunity to gain knowledge of technique in the fixing, embedding, and sectioning of selected organs.

304. *VERTEBRATE EMBRYOLOGY*. Spring term. Credit five hours. Prerequisite, Zoology 101-102, or 103-104 and 211-212. Zoology 301 is also desirable. Lectures, T Th 11, S 10. Laboratory, T Th 8-10:30 or 2-4:30. Mr. ADELMANN and assistants.

An introduction to general vertebrate embryology designed to provide a basis for

the appreciation of biological problems. The material is treated comparatively with particular emphasis on the development of the amphibian, the bird, and the mammal. A few invertebrate forms are used where desirable for illustration.

305-306. *HISTOLOGY AND EMBRYOLOGY*. Throughout the year. For students of veterinary medicine only. Credit eight hours. Fall term: lectures, T F 12; laboratory, W F 2-4:30. Spring term: lectures W F 9; laboratory W F 10-1:00. Messrs. ADELMANN and WIMSATT.

This course aims to provide the student of veterinary medicine with a practical knowledge of the normal structure and development of the tissues and organs of the animal body by the direct study of them in the laboratory. The emphasis of the course is on the domesticated animals of particular interest to the veterinarian.

401-402. *ECOLOGY AND PHYSIOLOGY OF THE INVERTEBRATES*. Throughout the year. Credit three hours a term. Prerequisites, one year of general biology or introductory zoology plus organic chemistry and Mathematics 154 or equivalent. Lectures M W 11. Laboratory W 2-4:30. Mr. COLE.

A course for advanced undergraduates and graduate students, stressing function at the level of the individual organism. Emphasis will be on physiological processes as these relate to natural habitats, and on phylogenetic characteristics as these restrict the variety of habitats available for occupancy by various invertebrates. The methods of response and toleration physiology will be utilized to investigate life processes in various invertebrates exposed to experimentally varied conditions. The interpretation of life tables and mortality data will be introduced as experimental techniques.

404. *GENERAL ANIMAL ECOLOGY*. Spring term. Credit three hours. Prerequisites, Zoology 101-102 or 103-104, or their equivalent. Lectures W F 10. A total of eight laboratory and field periods, S 8-1. Mr. COLE.

An introduction to the local and world-wide distribution of animals with reference to conditions of existence; effects of environmental factors on animals; adaptations to special habitats; modification of environment by animals; principles of population growth, composition, and density control. The adaptations of local animals to particular habitats will be studied in the field and laboratory.

451. *COMPARATIVE PHYSIOLOGY*. Fall term. Credit three hours. Prerequisites, one year of biology or zoology and college courses in chemistry and physics. Organic chemistry and comparative anatomy are also desirable. Lectures, W F 9. Laboratory, T W Th or F 1:40-4:30. Mr. GRIFFIN.

The principal physiological functions of both vertebrates and invertebrates, including respiration, metabolism, digestion, circulation, excretion, muscle contraction, nerve action, and physiological regulation.

452. *GENERAL AND CELLULAR PHYSIOLOGY*. Spring term. Credit three hours. Prerequisites, Zoology 451, organic chemistry, and permission of the instructor. Histology and calculus are also desirable. Seminars, M 2-4 or F 2-4. Laboratory, T W or Th 1:40-4:30. Mr. GRIFFIN.

The basic properties and functions of living material, including irritability, permeability, secretion, and the dynamic state of cellular constituents as demonstrated by tracer techniques.

[515-516. *INVERTEBRATE ZOOLOGY*. Throughout the year. Credit three hours a term. Prerequisites, Zoology 101-102 or 103-104, or equivalent. One lecture a week

during laboratory periods. Laboratory F 2-5 and S 9-12. Mr. YOUNG. Not offered in 1951-52.

Deals with the body plans, physiology, and development of the major groups of invertebrates. Consideration is given to the taxonomy and the life histories of animals affecting human welfare.]

040. *RESEARCH PROBLEMS*. Ordinarily limited to seniors only. Credit to be arranged. Problems may be undertaken in any phase of zoology, but the consent of the instructor concerned is a prerequisite. Hours to be arranged.

## ADDITIONAL COURSES IN BIOLOGICAL SCIENCE

*These courses may be counted in the ninety Arts hours required for the A.B. degree.*

*GENERAL BIOLOGY* (Biology 1, College of Agriculture). Throughout the year. Credit three hours a term. The course may be begun in either term. Not open to students who have had both Zoology 101-102 and Botany 1. If Biology 1 is taken after either Zoology 101-102, or Botany 1, credit two hours a term. Lectures and demonstrations, M W 9 or 11. Laboratory, M T W Th or F 2-4:30, or T or S 10-12:30. Mr. HOOD and assistants.

An elementary course planned to meet the needs of students majoring outside of the plant and animal sciences; particularly adapted as the first year of a two-year sequence in biology for the prospective teacher of general science in the secondary schools. The course deals with the nature of life, life processes, the activities and origin of living things. It covers the organization of representative plants and animals, including man as an organism, and the principles of nutrition, growth, behavior, reproduction, heredity, and evolution.

*ELEMENTARY TAXONOMY AND NATURAL HISTORY OF VERTEBRATES* (Conservation 8, College of Agriculture). Throughout the year. Credit three hours a term. Prerequisites, Zoology 101-102, or 103-104, or Biology 1. Lecture, M 8. Laboratory, M W or T Th 2-4:30. Mr. HAMILTON and Mr. RANEY.

Lectures on fishes, amphibia, reptiles, birds, and mammals, dealing with the principles of classification and nomenclature, characteristics, relationships, and biometrics of these groups. The laboratory gives practice in the identification of North American species. Field studies of the local fauna are undertaken during the fall and spring. During May, field trips will be taken at 5:30 A.M.

*GENERAL ORNITHOLOGY* (Conservation 9, College of Agriculture). Spring term. Credit three hours. Open to all students. Lecture, W 11. Field work and laboratory, M W or T Th 2-4:30. Mr. ALLEN and Mr. KELLOGG.

Introduction to the study of birds, particularly the local species; their songs and habits; designed to give a working knowledge to those wishing to study birds as an avocation, and fundamental to those planning advanced work in ornithology or wild life conservation. Laboratory work with bird skins is based on the field work.

*GENERAL ENTOMOLOGY* (Entomology 12, College of Agriculture). Fall term. Credit three hours. Prerequisite, Biology 1, Zoology 101-102, or Botany 1. Lectures, W F 9. Laboratory, W Th or F 2-4:30, or S 8-10:30. Mr. PATE and others.

Lectures on the characteristics of orders, suborders, and the more important



families, and on the habits of representative species; practical exercises in studying the structure of insects, their biology, their habits, and their classification.

303. *HUMAN PHYSIOLOGY*. Either term. Credit three hours. Prerequisite, a previous course, either in high school or college, in biology and in chemistry. Open to students in the Colleges of Arts and Sciences, Home Economics, and Agriculture, and to others. M W F 10. Mr. DYE and Mr. O'TOOLE.

This is an introductory course designed primarily to present fundamental and practical information concerning the physiological processes and systems of the human body. Lectures, illustrations, and demonstrations.

305. *ENDOCRINOLOGY AND METABOLISM*. Fall term. Credit three hours. Prerequisites, six or more hours of biology, and a previous or parallel course in organic chemistry. Open to upperclassmen and graduate students. M W F 8. Mr. DYE.

A study of metabolism, animal heat, excretion, endocrinology, and reproduction. Illustrated lectures.

## INTERDEPARTMENTAL COURSES

*The following course is offered cooperatively by the Departments of Zoology and Psychology:*

201-202. *HUMAN GROWTH AND DEVELOPMENT*. Throughout the year. Credit three hours a term. Not open to freshmen. Prerequisite, a laboratory science, preferably general biology or zoology. Course 201 is prerequisite to Course 202. Course 201: fall term: lectures, T Th 10; recitations, T 8, 9, 11, W 9, Th 8, F 8, 10, 11. Mr. —. Course 202: spring term: lectures, T Th 10; recitations, Th 9, 11, F 8, 10, S 10. Mr. FREEMAN.

The aim of this course is to integrate information about structural, physiological, behavioral, and intellectual aspects of growth and development that will help educators to understand human individuals as functioning organisms in a social environment. The materials of the course are selected from pertinent fields, including embryology, genetics, anatomy, physiology, neurology, hygiene, sociology, cultural anthropology, developmental psychology, and education.

## STATISTICS

Interdepartmental Committee: Mr. J. E. MORTON, *Chairman*; Messrs. M. BLACK, D. ENGLISH, W. T. FEDERER, M. KAC, H. J. LOBERG, P. J. McCARTHY, F. A. PEARSON, T. A. RYAN, A. SCHULTZ, E. A. SUCHMAN.

*A knowledge of statistical reasoning is becoming a necessary part of a general education, since such reasoning is essential in many walks of life. The layman as well as the specialist has need for some comprehension of this subject. In the theoretical and applied sciences, statistical methods are used more and more for summarizing data, making estimates, and deriving valid inferences. Principles of statistical reasoning are used in designing efficient procedures for surveys, tests, and experiments as well as in analyzing and interpreting the results.*

*In recognition of common interests in Statistics, a number of departments in the various schools and colleges have joined in sponsoring the following courses. A detailed description of each course is given in the Announcement of the college or school offering the course. Of the courses listed below and offered by departments in other colleges or schools, only Industrial and Labor Relations 210 and 211 may be counted in the ninety Arts hours required for the Bachelor of Arts degree.*

GROUP I: Courses in Group I are introductory and are regarded as preparatory for Group II. For this reason, credit may be given for only one of the courses in Group I.

*STATISTICS I (Statistical Reasoning)*. Industrial and Labor Relations 210. Credit three hours.

*MATHEMATICAL STATISTICS*. Mathematics 711-712. Credit six hours. Prerequisite, calculus.

*STATISTICS*. Agricultural Economics 111. Credit three hours.

*ELEMENTARY INDUSTRIAL STATISTICS*. Engineering 3241 (students taking this course will, as a rule, have had a course in calculus). Credit three hours.

*STATISTICAL METHODS OF ANALYSIS*. Plant Breeding 211. Credit three hours.

GROUP II: The prerequisite for the courses in Group II, with the exception of Mathematics 721-722, is one term of Statistics. A student intending to take several of these courses may elect them in any order. Members of the Interdepartmental Committee on Statistics will be glad to assist in making a choice from the offerings.

*STATISTICS II*. Industrial and Labor Relations 311. Credit three hours.

*PROBABILITY*. Mathematics 721-722. Credit six hours. Prerequisite, calculus.

*ANALYSIS AND INTERPRETATION OF SOCIOLOGICAL DATA*. Sociology 202. Credit three hours.

*DESIGN OF SAMPLE SURVEYS*. Industrial and Labor Relations 310. Credit three hours.

*ECONOMIC AND SOCIAL STATISTICS*. Industrial and Labor Relations 211. Credit three hours.

*EXPERIMENTAL METHODS*. Plant Breeding 212. Credit two hours.

*ANALYSIS OF VARIANCE*. Plant Breeding 213-214. Credit eight hours.

*STATISTICAL QUALITY CONTROL*. Engineering 3242. Credit three hours.

*STATISTICAL METHODS IN PSYCHOLOGY*. Psychology 375. Credit three hours.

## TUTORIAL PROGRAM

Interdepartmental Tutors: STUART M. BROWN, MARIO EINAUDI, EDWARD W. FOX, VICTOR LANGE, R. J. SCHOECK (Secretary), HAROLD E. SHADICK, LAURISTON SHARP.

*The aim of this program (which was initiated on a voluntary and experimental basis in the spring of 1948) is to provide for a selected group of students a course of humanistic study both broad in scope and rigorous in method. Each student agrees to take certain required subjects in Literature, Philosophy, and Government, as well as a Sophomore Reading Course and Junior Seminar, and, in addition, at the beginning of his senior year to stand a three-day comprehensive examination and, if qualified, to write a Senior Honors Essay under his tutor.*

*The tutors represent the following fields: Literature, History, Government, Sociology and Anthropology, Philosophy. Each student is assigned to a tutor for close supervision and guidance, but the*

*tutors accept responsibility for the group as a whole. Some fifteen to twenty students are selected at the end of their freshman year; they must be prospective majors in a field represented by one of the tutors, and they must convince the tutors that they are likely to profit by and contribute to the program. For further information consult Mr. SCHOECK.*

*The following courses are open only to students in the program:*

201-202. *READING COURSE.* Throughout the year. Credit two hours a term. Required of sophomores.

301-302. *TUTORIAL SEMINAR.* Throughout the year. Credit three hours a term. Required of juniors.

400-401. *INFORMAL STUDY.* Required of seniors.

## COURSES IN OTHER DIVISIONS

Courses of interest to students in the College of Arts and Sciences are offered by the Departments of Military Science and Tactics, Air Science and Tactics, Naval Science, Physical Education, and Clinical and Preventive Medicine and are described in the *Announcement of the Independent Departments*. Courses in other colleges and schools are described in their respective Announcements.